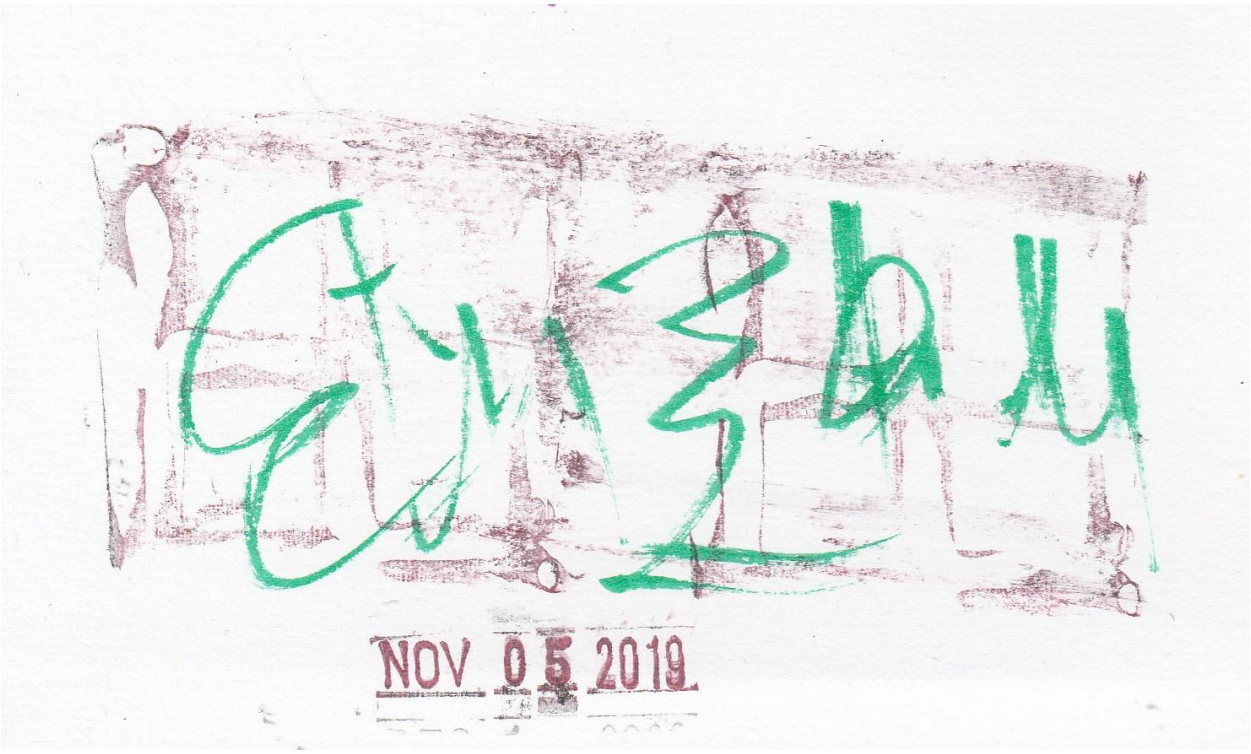
Jim Leftwich
Visual Poems Ongoing Research 2019 Vol. 2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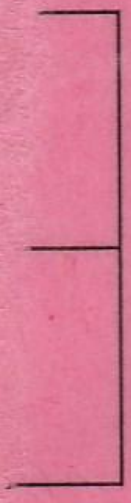

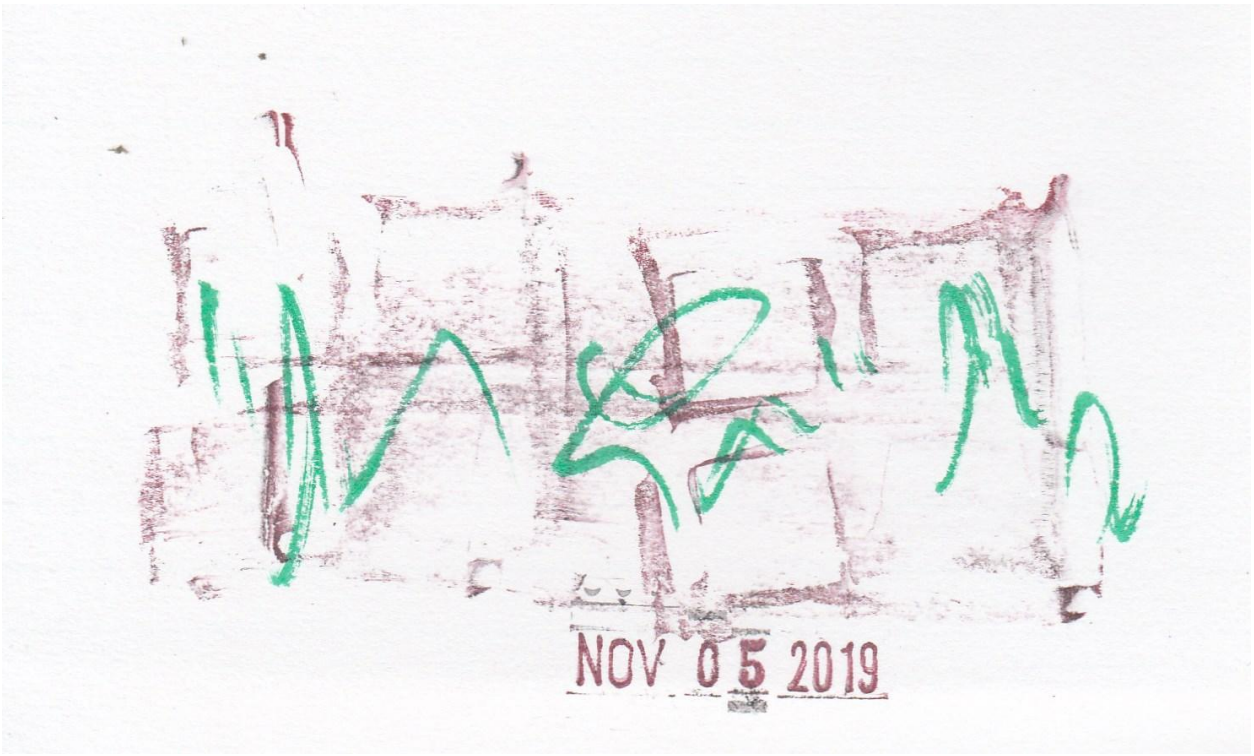
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AN BOUNDARY DISPUTE.

1 A bill may be introduced into the Senate or into the House of Representatives by placing it in a hopper on the clerk's table.

2 The bill is then sent to a committee for consideration. Here it is studied, together with related material provided by proponents and opponents.

3 If the committee approves the bill is killed. If the committee votes to become a law, it is reported out. Public hearings, which may last many days, are held for important bills.

4 Also, the committee may amend the bill or rewrite it on the basis of information provided by hearings.

5 After discussing the bill the committee takes action either by reporting the bill out favorably, perhaps with amendments, or by tabling it.

6 A bill receives three readings. The committee report is heard before the second reading of the bill.

7 The bill is then debated by the house where it was introduced. Here it may receive additional amendments. Because of the large number of bills, not all reach the stage of debate.

8 If the bill passes, it is sent to the other house. If the bill is amended there, it is sent to a conference committee of the two houses in order to work out a compromise.

9 If both houses pass the bill in the same form, it is then signed by the presiding officers of both houses and sent to the president.

10 If the president signs the bill, then it becomes a law, and the great seal of the United States is affixed to it. However, if the president vetoes the bill, it is returned to Congress.

11 After the vetoed bill has been returned to Congress, it is reconsidered. If two-thirds of both houses approve the bill, it becomes law despite the veto of the president.

12 A bill also becomes law if the president keeps it ten days without signing it. But if Congress adjourns before the ten days expire, the unsigned bill dies. This is a pocket veto. The president's veto power is a safeguard against ill-considered legislation.

A piece of legislation may go through many steps in the U.S. Congress before it becomes law. The illustrations above show these steps.

BILL, the draft of a proposed law presented for consideration by a legislative body. In the legislature of the United States, a bill, once introduced, may be considered in any session of Congress. If that Congress does not pass the bill, it dies at the end of the Congress. If a new Congress is to consider the bill, it must be reintroduced as a new bill. Bills for raising revenue must originate in the House of Representatives. By usage, bills of appropriation also originate in the House of Representatives.

BILLIARDS, any of several games played on a table covered with cloth that is enclosed by a leather-tipped, tapering wooden rod called a cue.

A crude form of billiards was played by the ancient Egyptians and Greeks. Although the modern game probably originated in England during the 15th century after an attempt was made to bring bowling indoors, it was in France that the game received its name and its first popularity. Billiards was carried to the New World in 1565 by the Spaniards who settled St. Augustine in Florida. George Washington, Thomas Jefferson, and Alexander Hamilton were all fond of the game and played it frequently. The first public match to which an admission was charged was played in New York in 1807. Today organized competition takes place on amateur, intercollegiate, and professional levels. Of special interest are the national and international contests held to determine the champions of the various types of billiard games. Among the recognized masters of the modern game were Willie Hoppe, Charles C. Peterson, Welker

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Wednesday, October 23, 2019
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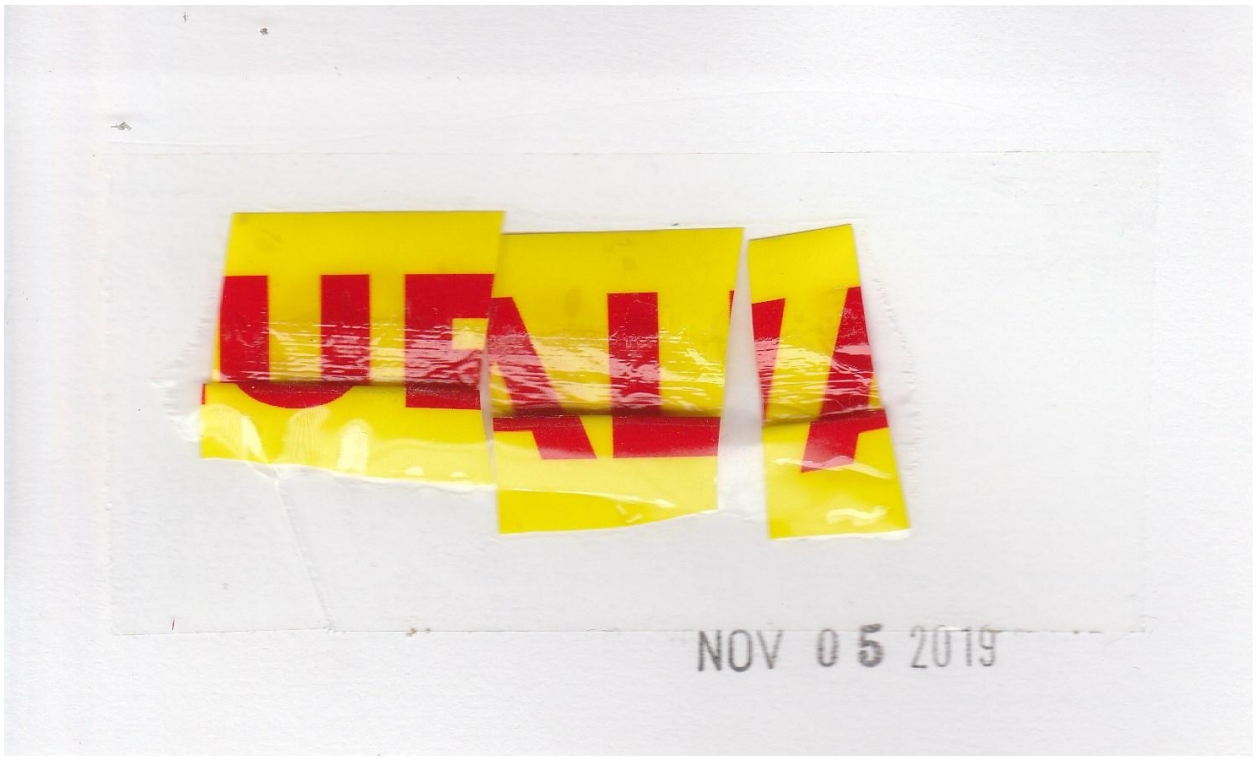
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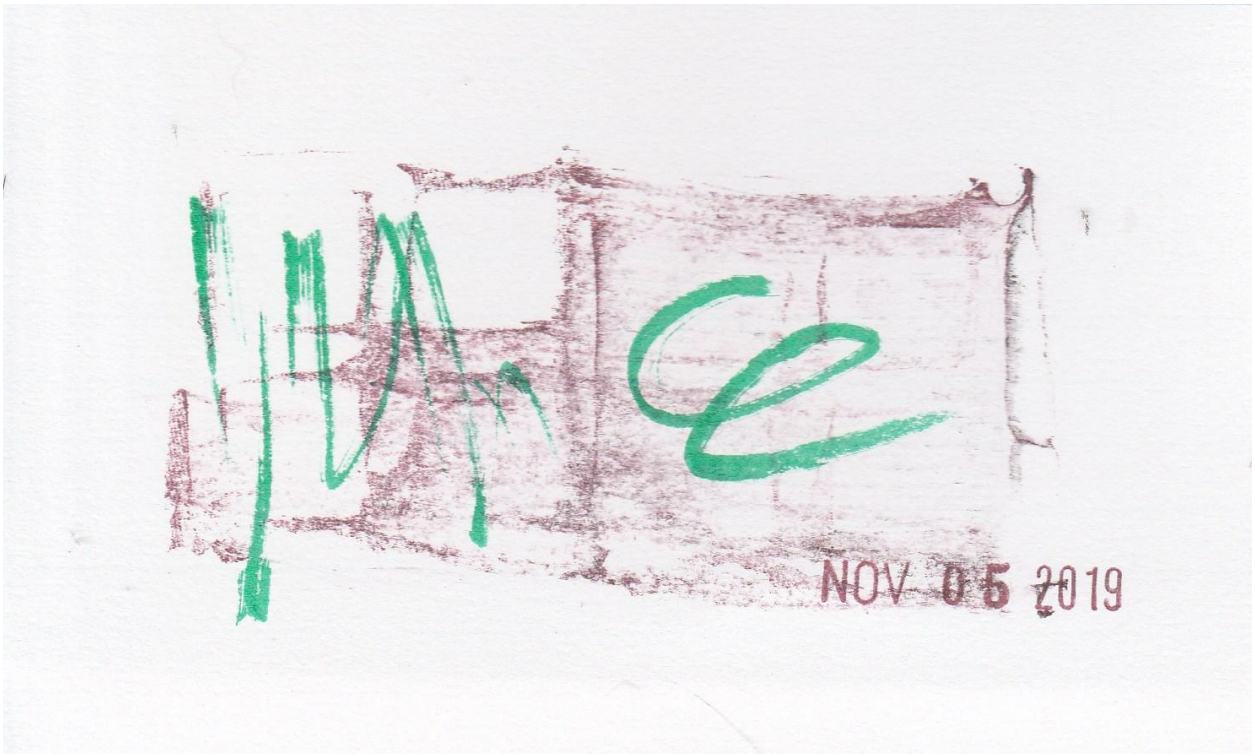
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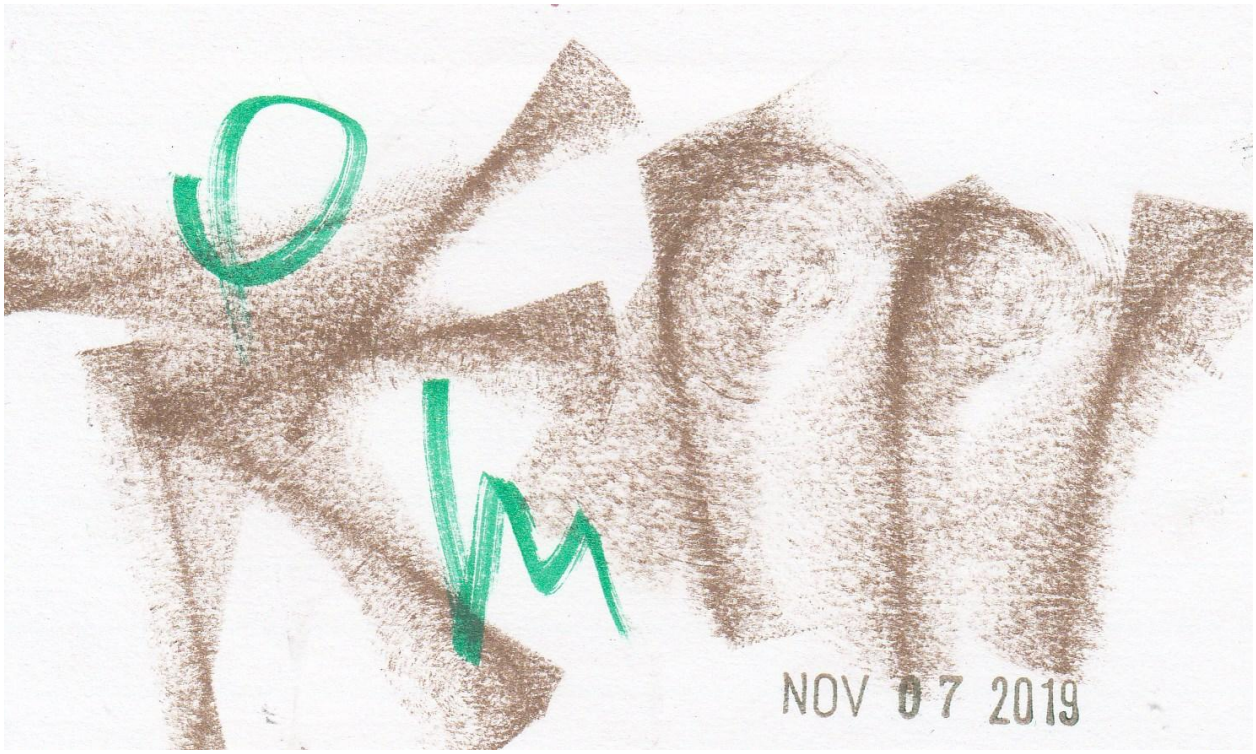
Chai-Spiced Apple Butter Cake
Apple Butter Old-Fashioned
$25 OFF
FREE INSPECTION

Adapted from "Vi uals" by Ronni Lundy (Clarkson Potter, 2016).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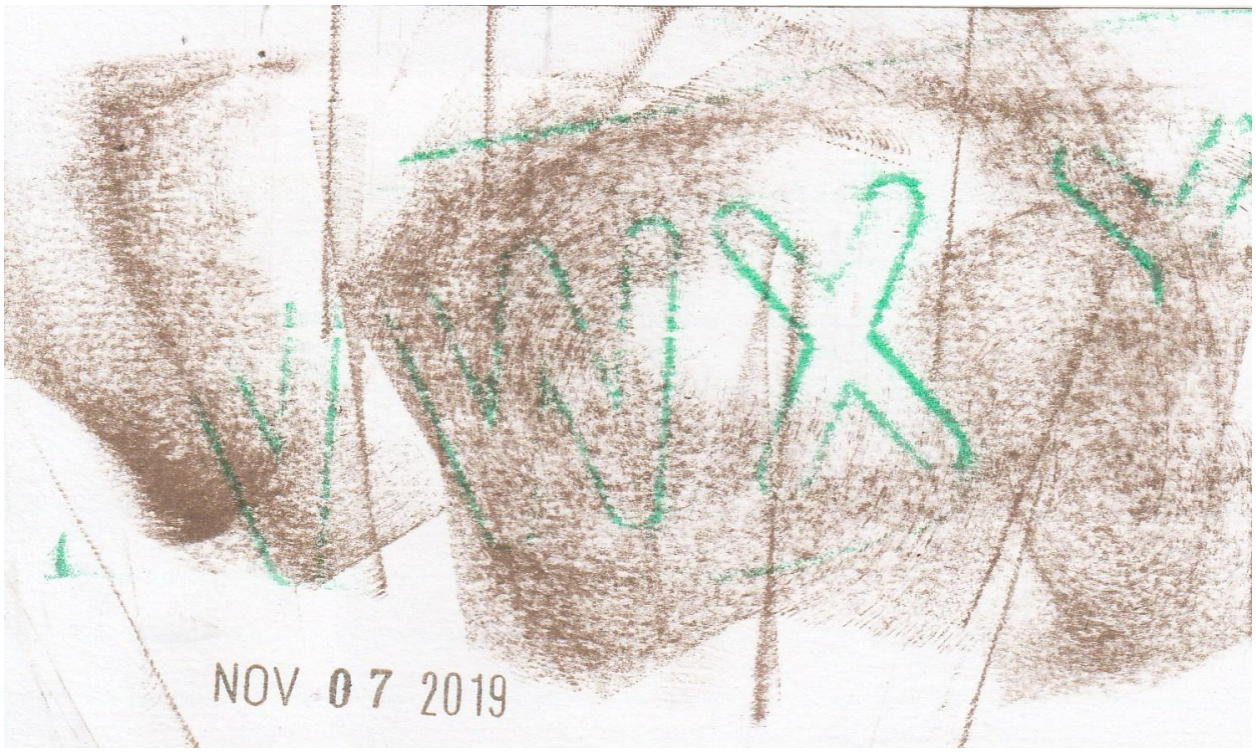
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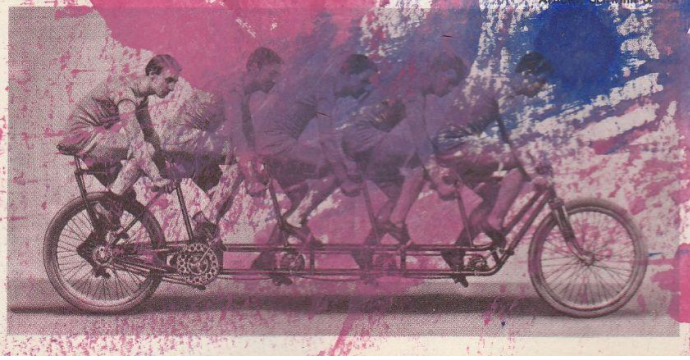
Hints on Bicycle Safety

This quintet is a racing team on a "quintuplet" (a bicycle for five). The year was 1[illegible]. Aboard are twins, a [illegible]



his feet. Pedals for the front wheel were not invented until many years later, and it was even later that the first bicycle with rubber tires and all-metal parts was made. Because a large pedal wheel would make the bicycle go faster, the front wheel was made bigger and bigger until it was 5 feet high; the rear wheel was only 1½ feet high. This put the rider high in the air, and he was very likely to tip forward if he stopped suddenly or hit a bump.

After years of popularity this bicycle, an "ordinary," was outmoded by the invention of chain drive. The pedals turned only a large toothed sprocket, and a small sprocket turned with the axle of the rear wheel. A chain fitting around the teeth of both sprockets converted the slow turning of the pedal sprocket into fast turning of the rear-wheel sprocket. This made fast speeds possible without fast pedaling, just as the large front wheel had done, but now the wheels could be the same size, making the bicycle much safer. This safety bicycle replaced the ordinary by 1895. About that same time tires inflated by air pressure were developed, and the modern bicycle was nearly complete. Later, coaster brakes, hand brakes, two-speed and three-speed gearshifts, electric headlights, and other improvements were added.

BICYCLING. See CYCLING.

Biela's Comet, not seen since it returned as a double comet in 1852, travels around the sun in the elliptical orbit shown here. The comet disintegrated into a meteor swarm.

BIELA'S COMET. You will never be able to see this comet because it disappeared in 1852. The comet is still famous over 100 years later because of the way it disappeared and what probably became of it.

Fire extinguisher
Shower tent
soap dispenser
brush
sunglasses
catnip
computer
gas can
carbon monoxide detector
Roadside emergency
jack
Tire patch kit

periodical in which the article appeared, the volume number of the particular issue of the periodical, and the pages on which the article

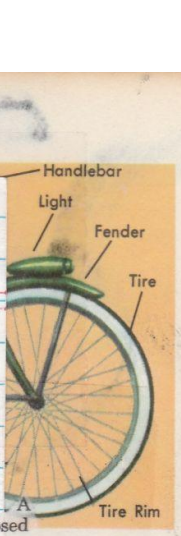
antee that they would never be deprived of this equality without their consent.

Bicameralism has also dominated

—where it is firmly established—but also in the state governments. This is partly the result of the English precedent and also of a major compromise of the Constitutional Convention of 1787. In this convention it was agreed that the number of representatives each state could send to each of the two houses of Congress should be proportional to the state's population. Large states like Virginia and New York, however, would have many more representatives than the small states, like New Jersey and Maryland. In order not to be placed at the mercy of the big states, the small states won equality of representation in the Senate but accepted almost all of the municipal legislative bodies within the United States had been organized unicamerally. See MUCKRAKERS.

BICYCLE, a vehicle with only two wheels, one in front of the other, connected by a frame. Standing still without support it falls over, but in motion it easily stays upright with the help of a rider's sense of balance and a slight amount of steering.

Considering the thousands of years the wheel and axle have been known, it is surprising to learn that the first bicycle was not invented until after 1800. It was just a seat on a frame between two wheels. There were no pedals or brakes.



proposed

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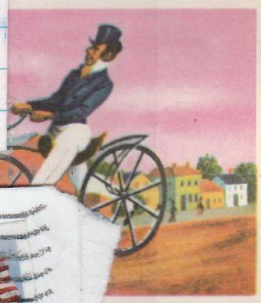
(middle), built in Germany in 1816. A present-day racing bicycle is shown at bottom.
Arnold, Schwinn & Co.



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Wilhelm von Biela discovered it in 1826 and found that it was traveling around the sun in 6¾ years, not going much beyond the orbit of Jupiter at its farthest point. The comet had been seen twice before, but no orbit could be computed for it at those times.

When the comet appeared on schedule in 1845, to everyone's amazement it broke in two. The two parts returned in 1852 as expected, but they were much fainter and over one million miles apart. The next appearance was too close to the sun for observation, and in 1872 the comet did not appear at all. Instead there was a brilliant meteor shower, traced to the same orbit as the lost comet. Regular meteor showers since then have been traced to the comet's orbit. They are called Andromedids, or Bielids. Some of them may well be the remnants of the old comet. The meteor swarm has apparently shifted largely out of the path of the earth's orbit, for the meteor showers have now become quite small.

BIENNIAL PLANT. See PLANT, ANNUAL, BIENNIAL, AND PERENNIAL.

BIENVILLE, JEAN BAPTISTE LE MOYNE, SIEUR DE (1680-1768), a French-Canadian nobleman who was three times governor of Louisiana, founded Mobile and New Orleans, and promulgated the black code.

Bienville was born in Longueuil, near Montreal, Canada, the eighth son of Charles le Moyne. The Le Moynes distinguished themselves as representatives of the French kings in the New World. Jean Baptiste inherited the title sieur de Bienville from a brother who was killed in the Iroquois wars.

In 1698 Bienville accompanied his brother Pierre, sieur de Iberville, who headed an expedition to the mouth of the Mississippi River. The French governors of Canada encouraged the exploration of the Mississippi Valley and the founding of French colonies there. Iberville founded a small colony at Biloxi and left Bienville second in command. From the time of his arrival Bienville was engaged in exploration and in negotiations with the Indians. Succeeding to the governorship, Bienville was also commissioned as the king's lieutenant and built Fort Louis on Mobile Bay. In 1710 the headquarters of the colony were moved to the site of present Mobile.

Between 1712 and 1717 the French king granted Louisiana to a trading company, and Bienville was replaced by another governor. But he was reinstated in 1718 by the reckless financier John Law, who plunged France and England into the financial chaos known as the Mississippi Bubble. Bienville founded New Orleans in 1718 and made it the capital in 1722. He also promulgated the black code, issued by the king of France, in 1724. This code fixed the legal status of the Negro slaves in Louisiana and imposed certain obligations on their masters. In the same year Bienville was deprived of the governorship and recalled to Paris. In 1733, however, he was sent back to Louisiana to placate the rebellious Indians, especially the Natchez and the Yazoo, who had begun to trade with the English. Bienville fought indecisive wars against the Indians and then retired from the governorship in 1743, never to return to Louisiana.

BIG BEND NATIONAL PARK has spectacular mountain and desert scenery. It encloses in the great U-shaped bend of the Rio Grande. The park, located in the extreme western part of Texas, is on the Mexican border. It covers more than 1,000 square miles and was established in 1944.

The park has many con[illegible] Mountain ranges, broad valleys, deserts, and spectacular canyons are results of the action of geological forces. The animal and plant life is more characteristic of Mexico than of the better known parts of the United States. One of the most unusual animals is the wild hog, or javelina.

Prehistoric Indians once lived here. Numerous remains have been found in dry caves and rock shelters. Apache Indians, Spanish conquistadors, and missionaries also were active in the area.

BIG-GAME HUNTING. The term "big game" refers to wild, four-footed animals that are killed with high-powered rifles. Big-game animals include the elephant, buffalo, rhinoceros, lion, leopard, bear, [illegible] larger members of the deer and antelope family.

Big-game hunting was a favorite sport of kings and nobles from the earliest times. Assyrian, Babylonian, Egyptian, and other ancient sculptures and paintings show scenes of big-game hunts with bow and arrow and spear. The men are usually shown hunting from chariots or on horseback. In the Middle Ages the kings and their courts in Europe organized boar and bear hunts, and

Big Bend National Park contains traces of old volcanic activity. Some of these traces are noticeable here in the rimrock of the Chisos Mountains, one of the area's chief mountain ranges.
National Park Service


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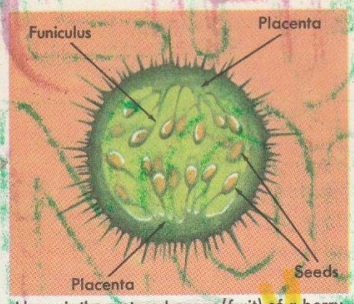
proportion of heads is one-half, although other proportions are still possible but have a lower probability. However, if the number of tosses increases toward infinity, the likelihood that the proportion of heads will be exactly one-half does not approach certainty. Bernoulli's theorem states instead that as the number of tosses increases toward infinity, it becomes increasingly certain only that the proportion of heads will be within a certain range of one-half. To state this in general mathematical terms, let p stand for the probability that an event will occur, let t stand for the number of opportunities for it to occur, let s stand for the actual number of times [illegible] stan[illegible]

Ther[illegible] appr[illegible] as t [illegible]

BERI Ame[illegible] pian[illegible] Afte[illegible] Harv[illegible] at tl[illegible] Phila[illegible] sista[illegible] vitsk[illegible] ter. [illegible] was [illegible] York[illegible] chest[illegible] withe[illegible] until [illegible] New [illegible] made[illegible] ducte[illegible] orche[illegible] he b[illegible] cond[illegible] Italy [illegible] tions [illegible] whicl[illegible] Circl[illegible] No. 2[illegible] musi[illegible] *Trou*[illegible] musi[illegible] *derfu*[illegible] *Story*[illegible] and *F*[illegible] Berks[illegible] and E[illegible] In 1957 he became co-conductor of the New York Philharmonic Symphony Orchestra, and in 1958 he became its musical director.

BERRY, a small, fleshy fruit that usually has many tiny seeds but no stone. Common berries are the strawberry, red and black raspberries, the blackberry, the cranberry,



Above is the matured ovary (fruit) of a berry, the currant. The ovule, which develops into a seed, is attached by a funiculus to special ovary tissue called the placenta.

the currant, and the blueberry. [illegible] usually tart to [illegible] sugar to bring flavor. Because [illegible]spberries, black-[illegible]erries make de-

[illegible]ltivated today [illegible]rough the years, [illegible]r wild ancestors [illegible]al breeding. The [illegible]ancestor of our [illegible]es, was much [illegible]rer flavor. Wild [illegible]erries are smaller [illegible]s.

[illegible]omato are really [illegible]ey are not popu-[illegible]ich. The garden [illegible]e largest of the [illegible]artifically bred [illegible] wild ancestors [illegible]ica. Raspberries [illegible]row on thorny [illegible] 4 to 6 feet tall. [illegible]t is a perennial [illegible]ver the ground. [illegible] an annual herb [illegible]d foliage. Mul-[illegible]s and have little [illegible] tasting.

[illegible] aluminum sili-[illegible]often occurs in [illegible] The crystals are [illegible]rm of hexagonal [illegible]ned ends. The [illegible]ugh or striated [illegible] the crystal sur-[illegible]ls are usually [illegible]ht yellow, but they may be green, gold, pink, white, or colorless. They are transparent or translucent.

The valuable emerald is deep-green beryl.

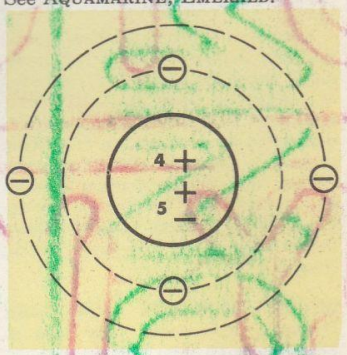
Beryl

Deep-green beryls are called emeralds and are valuable gem stones. A good emerald may be of more value than a diamond. Pale greenish-blue transparent beryls are aquamarines.

Beryl is a very hard mineral and has a hardness of 8. It is much harder than quartz.

Beryl is a rather common mineral and is found in many rocks. It is found in pegmatites, granitic rocks, and some schists and other metamorphic rocks. The chief source of emeralds is Colombia. Another locality famous for its emeralds is in Siberia. Aquamarines of gem quality are found in Brazil, Siberia, and Madagascar. In the United States beryl is found in New England, North Carolina, Colorado, the Black Hills of South Dakota, and other places.

Beryl is the principal ore of the metal beryllium. Beryllium is chiefly used to make an alloy of copper. See AQUAMARINE; EMERALD.



A beryllium atom (atomic number 4, atomic weight 9) has a nucleus containing 4 protons (+) and 5 neutrons. Its second, and outer, shell contains only 2 electrons (−).

BERYLLIUM is the element of least atomic weight in the alkaline-earth metals group of the periodic system. Its atomic number is 4, its atomic weight is 9, and its symbol is Be. Beryllium has unusual properties. Unlike other alkaline-earth metals, it can form covalent bonds with nonmetallic elements. It is harder than other alkaline earth metals, has a higher melting point, is the least dense of the group, and is the least active. Beryllium ions are the smallest of all metallic ions.

The mineral beryl is the chief source of beryllium. Beryl is mined in North America, South America, Africa, and India.

Beryllium is much used in copper-beryllium and nickel-beryllium alloys. Beryllium-containing alloys

are hard and tough, withstand vibration, can be made into long-wearing springs, and are more resistant to corrosion than is stainless steel. Because of their resistance to corrosion, alloys containing beryl-

FOR LESS

trons. The uses of beryllium are limited because its dusts, vapo nd soluble co pounds are p s.

(1779-

In 1808 he be-

Sciences and in

baron.

Berzelius determined the atomic and molecular weights of some 2,000 substances. He experimented in electrolysis and discovered several new elements. He also introduced the pres chemical sym Before his dea *of Chemistry* i vised these s them abreast chemistry.

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BESSEMER, an English Charlton, England. He began modeling and designing patterns when 18 years old and as a profession. Hi tion was a proce rapid turning Molten iron was shaped container. blasted through it purities. This pro the Bessemer proce came very wea discovery. He was

1879.

Courtesy TWA

The Church of the Nativity the site of Jesus's birth.

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the Jewish e first part , known as ithin Christianity the Protestant versions of the Old Testament include only these books; Roman Catholic versions also include additions to two of the books and seven other separate books, and the Eastern Orthodox version accepts four out of this additional group.

The other part of the Christian Bible, called the New Testament, contains 27 books written in Greek during the 1st and 2d centuries


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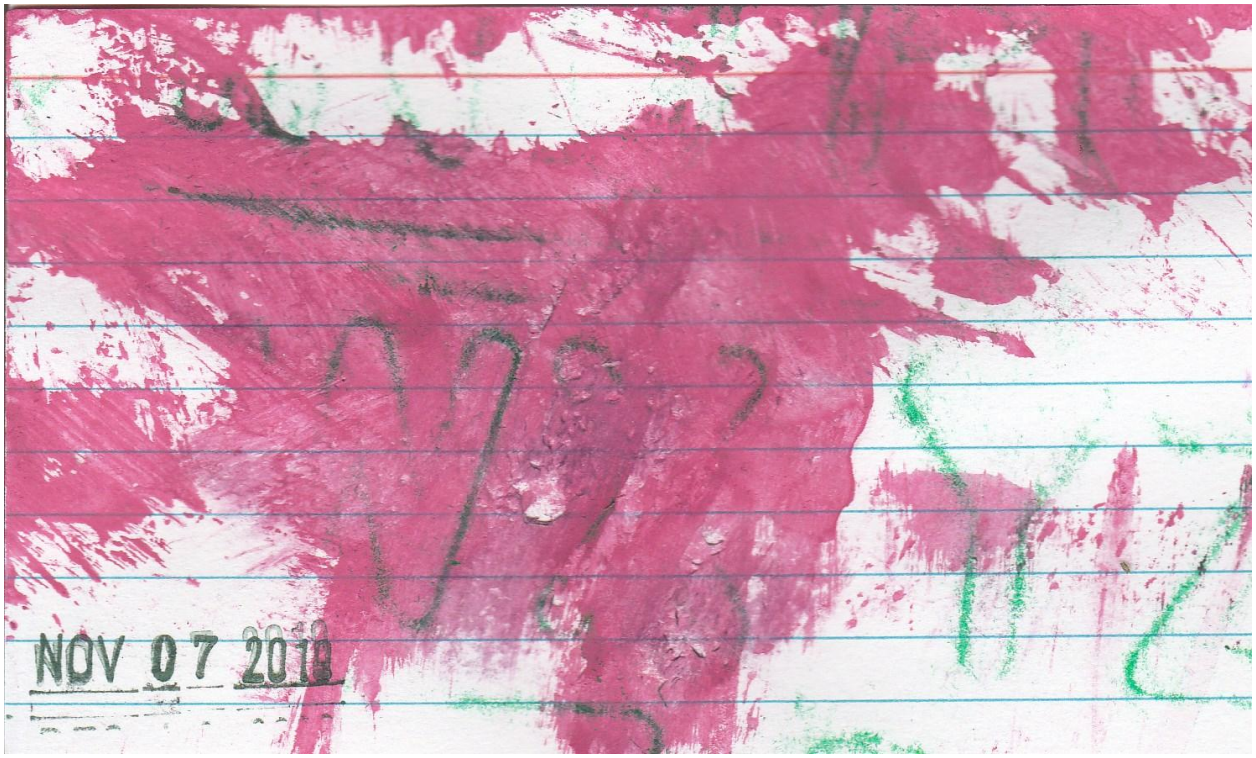
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city to a shambles. West Berlin, allied with the German government in Bonn, was supported by, and rebuilt with the help of, the United States, Great Britain, and France. There are scores of new buildings. Streets are crowded with traffic; there are [illegible] with ample food, and stores with full stocks of merchandise. In East Berlin, under Soviet control, there are more ruins, less traffic, fewer goods, and higher prices.

Two villages, Kölln and Berlin, originally stood where the city now is. They were united in the early 1300's. As they grew larger, the name Berlin was given to both be[illegible]s too much

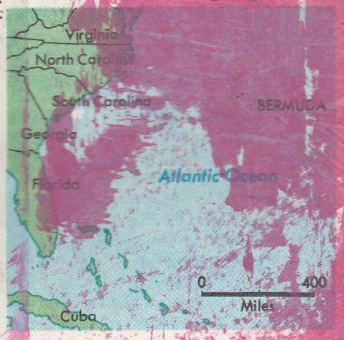
with chorus *Romeo and Juliet*, the concert opera *The Damnation of Faust*, the Christmas oratorio *The Childhood of Christ*, and the mammoth opera *The Trojans*—demonstrate his power and originality and his always brilliant orchestration, at which he is recognized as one of the greatest masters. In many of his other works he was less successful.

BERMUDA is a British colony made up of a group of some 300 small coral islands, 20 of which are inhabited. The mild climate and tropical scenery of the islands make them a popular winter resort. Bermuda lies in the west Atlantic about 580 miles southeast of Cape Hatteras, North Carolina. Its capital and largest town, Hamilton, is situated on Bermuda Island, which lies in the center of the group. There are more than 40,000 inhabitants of Bermuda, and over half of them are Negro.

Originally, tobacco was the chief export of Bermuda, but tobacco cultivation declined during the 18th century. Easter lilies are now among its chief exports, but tourist trade provides most of the income of the colony.

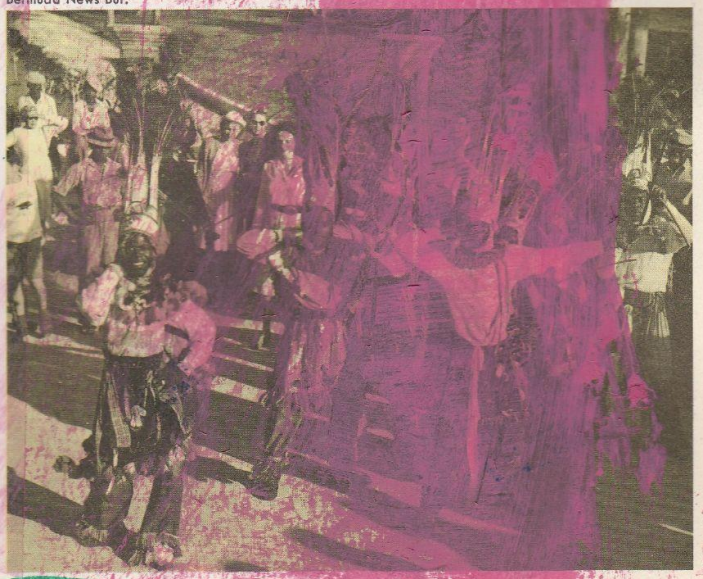
The islands were first visited by the Spanish early in the 16th century. They received their name from Juan Bermudez, who was shipwrecked among them. In 1609 George Somers, an Englishman, made the first settlement in Bermuda when he and a group of colonists were shipwrecked there. The British crown took over Bermuda in 1684 and has ruled it ever since. The government of the island is now semirepresentative.

In 1940 the British granted the United States a 99-year lease to air and naval bases on the islands.



BERN, the capital of Switzerland, in the west-central part of the country, on the Aar River. The old central part of the city stands on a bluff 180 feet high, surrounded on three sides by the river. The city's population is about 160,900, approximately the size of Sacramento, Calif. Bern contains many medieval fountains, towers, and arcaded streets. The famous Clock Tower, dating from 1530, has a clock with mechanical

The gombays, below, dance for tourists at Easter and Christ[illegible] in the streets of Bermuda. Their dances, costumes, and drums are thought to be derived from ancient African tribal dances.
Bermuda News Bur.



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Bern was founde
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thold V of Zähringen. Emperor
Frederick II made it a free imperial
city in 1
and in 1353 it joined
the Swiss
federati
Under the
constitution
ern became
the federal capita

BERNADETTE, SAINT (18
a saint
the Roman Catholic
Church, was born Bernadette Soubirous in Lourdes, France. In 1858, on some 18 occasions, she reported visions of the Virgin Mary in a grotto near Lourdes. In these visions the Virgi
d to create
great
miraculous
told Bern
should be b
men were sk
appear. Th
since been
and nume
have been at
Bernadette
Charity. She
can

BERNARD, CLAUDE (1813-1878), a French physiologist, was born in Saint-Julien, department of Rhône. As a you
man he worked at a druggist's
d hoped to become a playwright. On going to Paris, however, he de
ided to
ke up medicine instead and became, in 1841, an assistant of the physiologist Magendie.

Bernard made three very important contributions to the science of physiology. He discovered the significance of secr
ion of the pancreas in the
ocess of digestion, particularly in the brea
ing down of fats. He disco
ed the function of the liver in chang
g sugar into glycogen (animal starch) and storing it as a reserve food supply. He discovered the vasomotor system of nerves that controls the contraction and
f blood vessels and
of blood going
ody.
cupant of
the Sor-
published

AUX, SAINT
who held ex-
the Roman
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ars old, he left
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wo
eat was his
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that he was asked
settle the
schism that arose
the church
when Innocent II and Anacletus II were rival candidates for the papacy. Innocent II was named by Bernard and was shortly recognized as pope.

Bernard was perhaps the chief force behind the Second Crusade to the Holy Land. He went through Euro
using enthusiasm by his
When the
great
er-
canoniz

BERNHARDT, SARAH stage name of Sarah Henri
te Rosine Bernard, French actress, born in Paris. She became a drama student at the Paris conservatory in 1858. She made her theatrical debut in 1862 at the Comédie-Française; then she tried burlesque but was unsuccessful. She first attracted attention in Coppée's *Le Passant* in 1869 and in 1872 became famous for her performances
King Lear and Victor Hugo's
She acted with the Comédie-Française on several occasions until 1880, when she began managing her own theaters. She appeared in London in 1879, made several tours of the United States between 1880 and 1918, and acted in South America and Australia.

Sarah Bernhardt, who continued

Sarah Bernhardt toured North America, South America, Europe, Australia, and Egypt.

her acting caree
until her
ath, was also an accomplished painter and sculptor. In addition
she wrote poetry and plays.

BERNOULLI'S THEOREM, the law of large numbers, a mathematical idea about probability, was first
ublished in 1713 afte
the death of its originator, Jakob Bernoulli. It has become a basic theorem in statistics, although its validity has been questioned.

Bernou
in how
h theo-
e same
nce, in
proba-
a single
et if a
actually tossed ten times,
result may not be five heads and five tails, but perhaps six heads and four tails or even all heads. What intrigued Bernoulli was the question, What would happen to the distribution of
s and tails if a coin were tossed
sands or millions of times? Out of a
usand tosses would the number of heads be close to one-half the tosses? Out of a million tosses would heads occur closer to exactly one-half the tosses than it would in only a thousand tosses? If the coin were tossed an infinite number of times, what would happen? Would the number of heads approach exactly one-half as the number of tosses increased toward infinity?

Bernoulli considered this question for 20 years before he gave his conclusion. He stated that in a large number of tosses the most probable


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the sorrowful lament of his people. Interspersed in the poem are numerous references to other characters and brief accounts of other episodes in Germanic mythology. These allusions, all of which were readily understood by the poet's audience, emphasize Beowulf's greatness by contrasting him with others and also heighten the tragic atmosphere of the poem by furnishing sober reminders of the hero's impending doom.

The deep Germanic roots of *Beowulf* are emphasized by its setting being Scandinavia rather than England and by the essentially pagan outlook of the work, an outlook that persisted, although the Anglo-Saxons had been converted to Christianity over a century earlier.

Beowulf was intended to be chanted rather than silently read. The performer emphasized the rhythm of the poem by accompanying himself on a small instrument resembling a harp. Each line is divided into two parts, and each part contains two strong beats. There are no rhymes; alliteration (repetitions of the same sound) and a strong rhythm are the principal poetic devices. These characteristics are well illustrated in the closing lines of the poem:

Cwædon þæt hē wære wyruld-cyninga,
manna mildust, ond mon-þwærust,
lēodum liðost, ond lof-geornost.

("They said that he was among earthly kings the mildest of men and the gentlest, the kindest to his people and the most eager for fame.")

BERENICE'S HAIR (constellation). See COMA BERENICES.

BERG, ALBAN (1885-1935), an Austrian composer, was born at Vienna. He early showed his musical talent, his first songs being written in 1900. Four years later he met Arnold Schönberg, who was then teaching in Vienna. Schönberg was a great influence on Berg. In 1913 Berg's first orchestral works were performed under Schönberg's direction, and a riot broke out in the audience, cutting short the concert.

Berg saw service in World War I, and during this time he worked on his opera *Wozzeck*, based upon the play by Georg Büchner. The premiere of this work was given in Berlin in 1925 and created a sensation. In 1928 he began work on a new opera, *Lulu*. This work was unfinished at the time of the composer's death. In its unfinished form it was first performed in 1937. Berg also is noted for his Violin Concerto and for his chamber music.

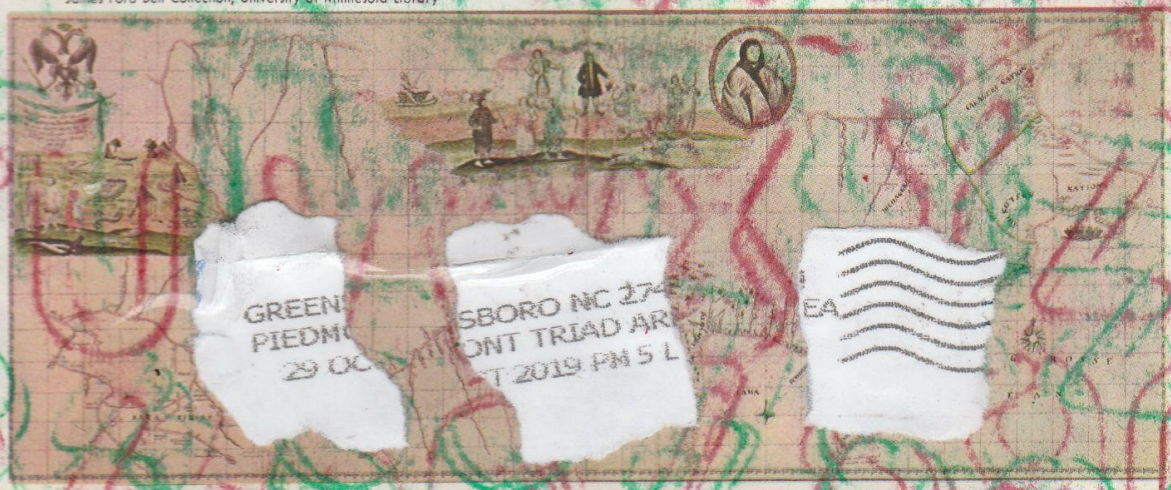
BERIBERI is a disease occurring chiefly in oriental nations, where the diet is composed mainly of rice. Sailors and poor landsmen have been victims of the disease. It takes a variety of forms, but the characteristic symptoms are general paralysis and wasting away of the muscles. It is known as the B_1 vitamin-deficiency disease. Experimentally, the condition has been shown to be caused by a limited diet of polished rice, rice from which the outer layers of the grains have been removed. If the polishings are restored to the diet, the disease disappears. If such materials as meat and barley are added to the polished rice, the disease does not occur. Such foods as whole wheat, brown (unhulled) rice, and especially brewer's yeast and wheat germ are rich in vitamin B_1, or thiamine, the antineuritic vitamin. This vitamin protects the nerve tissue against degeneration and prevents beriberi.

BERING, VITUS (1680-1741), a Danish explorer, was born in Jutland. After making several voyages to the East and West Indies, he entered the service of Russia while still a young man. By 1722 he was a captain commander.

Catherine the Great put him in charge of an expedition that was sent to determine whether Asia and America were united. He discovered, in 1728, that Asia was not joined to America. He found that the two continents were divided by a strait about 50 miles wide, which connected the Pacific and Arctic oceans. This strait is now known as the Bering Strait, and the sea between it and the Aleutian Islands is called the Bering Sea. In 1741 Bering was shipwrecked on an island in the Bering Sea and died there that same year. The island is also named after him.

The route of Vitus Bering in his five-year expedition across the mainland and along the coast of Russia is shown in this old Russian map made in 1735. Bering built his boat, *St. Gabriel*, at Kamchatka (labeled "Chamscatka") and sailed north, exploring the coast.

James Ford Bell Collection, University of Minnesota Library



BERKELEY, GEORGE (1685-1753), Irish phil... Thomast... Trinity ... famous a... in reacti... in John... *ing Hu...* ley's an... his *Tre... ples of* was o... popu... though... *tween Hylas and Philonous,* was published. Berkeley treated mind, not matter, as the fundamental quality governing the world. Things exist, Berkeley said, only because a mind perceives them, and experience is our assurance of the existence of this mind. Berkeley granted that numerous things exist that are not yet perceived, but he claimed that such things exist in the mind of God, whose existence is made mani-fest through the order we perceive.

...arted a move-...sic away from ...d and toward ...

...scores of pop-...Many of them ... numbers in ...icals. *Annie ...aster Parade ...dam* (1950) ...hows.

...rded him a ...iotic songs, ...ncluded ...ny Bonds ...Today" and "God Bless America."

BERLIN, IRVING (1888-), stage ... name of Israel Baline, American songwriter, bor... Russia. Wh... he was four ... New York City ... ly moved to ... school for t... ...ended gr... his father ... then, after ... ...rn a li... ...ing ... as a ... ...writer. In the ... wrote ... first published ... "Alexander's Ragtime Band," which came four years later, was a spec-

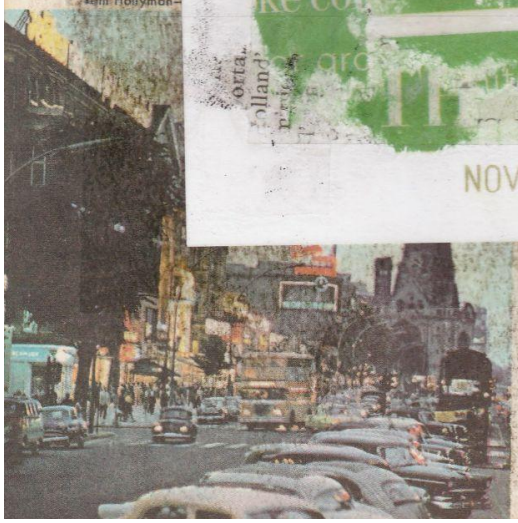
BERLIN is the largest city in Ger... Before ... it was ... known ... museums, picture ... ...ublic buildings, and ... beautiful ga...ns. Most of these were destroy... or damaged during World War II. The city's university was one of the best in the world. After the University of Ber... came under Soviet con... ...wing World War II, th... ...ue University of Berlin was ope... in West Berlin. Occupied and di...ed in 1945, the city has two gov...ments and two ways of life. Abo... ...000,000 people live here.

The Spree Riv... ...ributary of the Elbe, runs through the ... of Berlin. Railroads converge on the city, and there are several airports. ...manufacturing ...goods, textiles ...s, machinery, ...y British and ...during World ...center of the

German Touris...

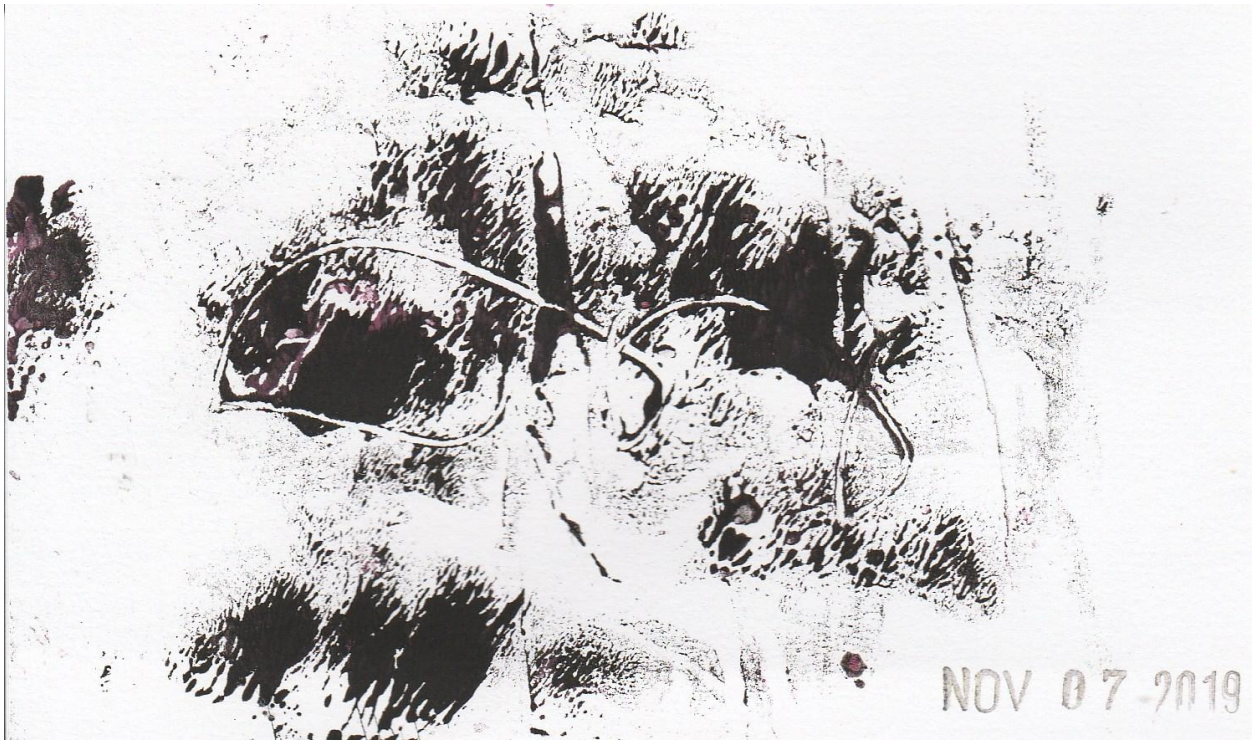
Above is Te... airports and ... Below is the ... fashionable ...

Tom Hollyman-



German Tourist Inf. Off.

Above is another famous Berlin landmark, the Brandenburg Gate, built in 1793.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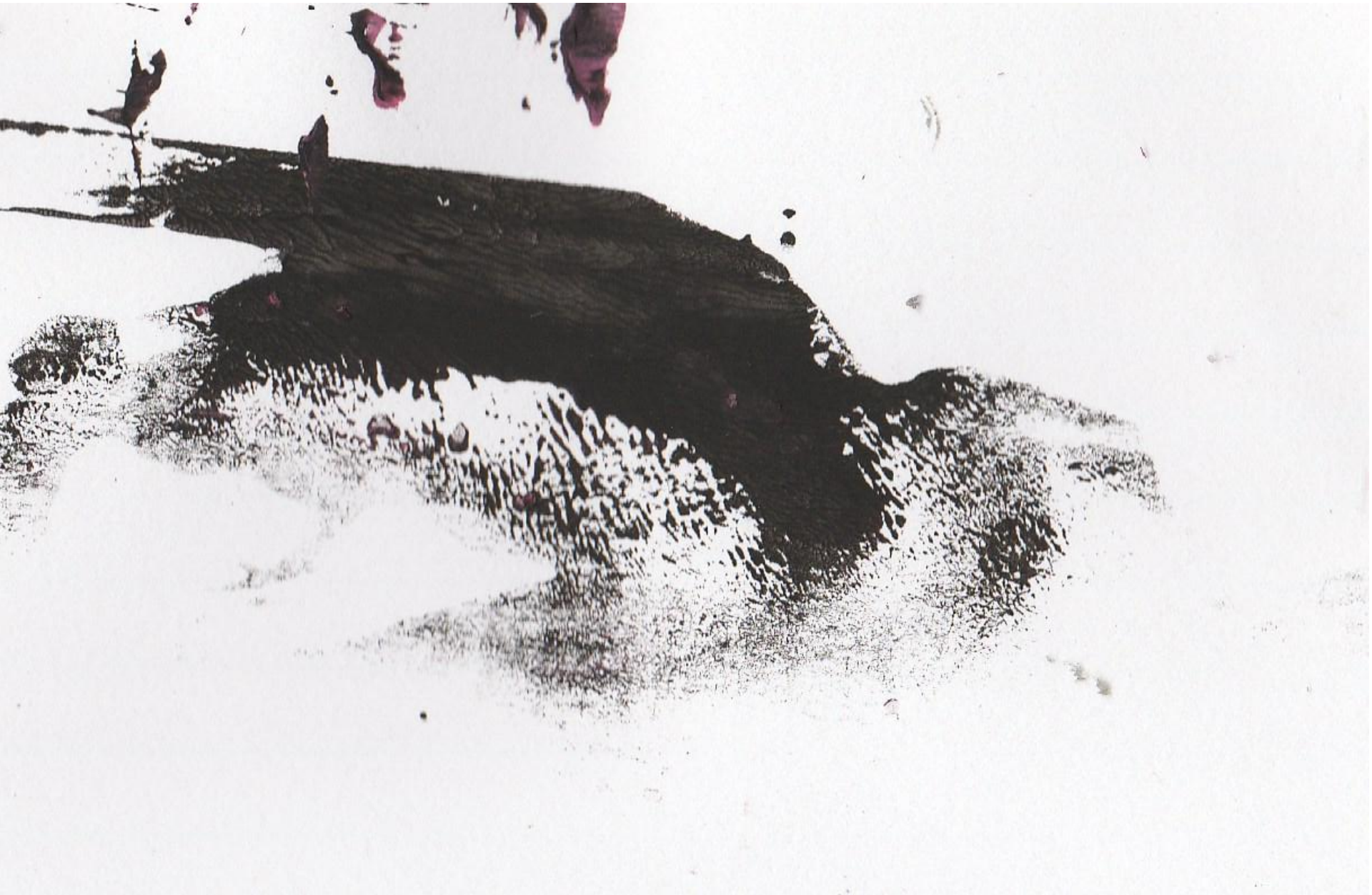


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MEAT

...almost no ... Australia and Argentina ... almost twice as much beef ... son as do Americans ... the past ... almost ... ers ... terr... reli... bak...

... CATTLE. See RANCH AND RANCHING.

... cattle not crop, raised ... must have ... use as a ... grown on a ... livestock food ... production of ... beef comes from dairy farms. Among the most popular beef breeds are the white-faced Hereford, the Angus, and the Shorthorn. England is still the best source of the world's breeding stock, while Argentina pays the highest prices for breeding stock. Beef raised on good high-protein grass and hay is as nourishing as beef fattened in feed yards on grain and food concentrates, but the latter is generally superior in tenderness and flavor.

Beef cattle are processed into ... products in small, local slaughterhouses and in great centralized packinghouses like those in Omaha, ...

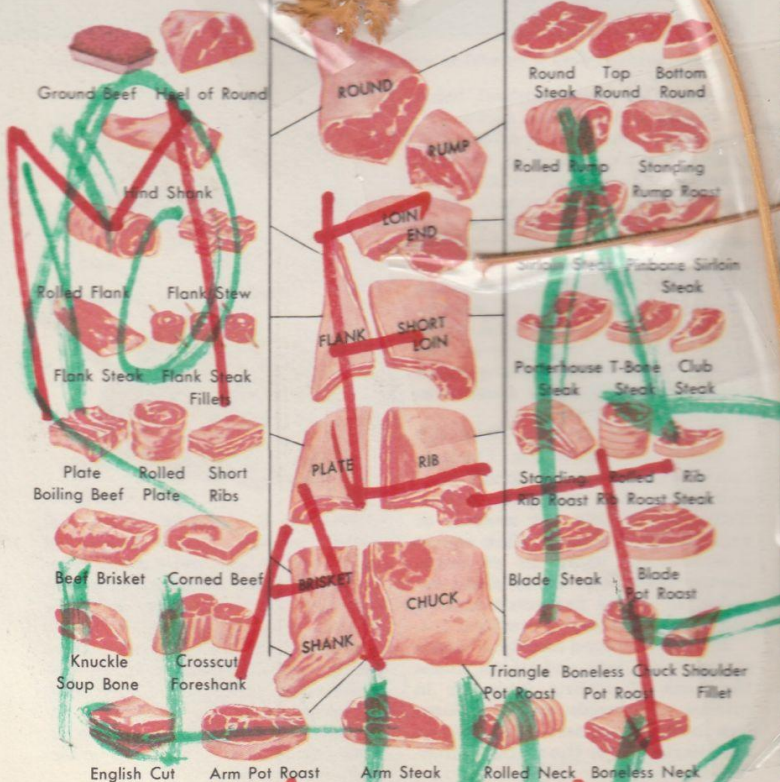
... tuft of leaves the first year and ... going to seed the second ... often ... All ... sugar ... SUGAR BEET.

Below is the ...

... beet plants ... much used for ... a native of ... When the beet ... America is not ... 100 years it ... American gar... belongs to the ... with pig... ard and man... varieties of ... seen in ... because it is a ... biennial, ... forming its fleshy, edible root and a

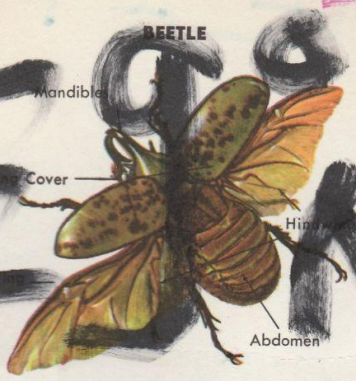
BEETHOVEN, LUDWIG VAN (1770-1827), German composer, was born at Bonn on the Rhine River. His early life was marked by poverty and by the attempts of his father, an alcoholic singer of little talent, to exploit his son's musical gifts. When he was 17 years ... Beethoven somehow managed ... money for a trip ... where he played ... used ... him ... Two ... again went to Vienna ... to study with Haydn. ... short-lived, but ... established himself in ... the rest of his life ... made friends ... music-loving aristocrats and, thanks ... their support, would have had little difficulty supporting himself ... he had any financial sense.

Courtesy RCA Educ. Services



MEAT

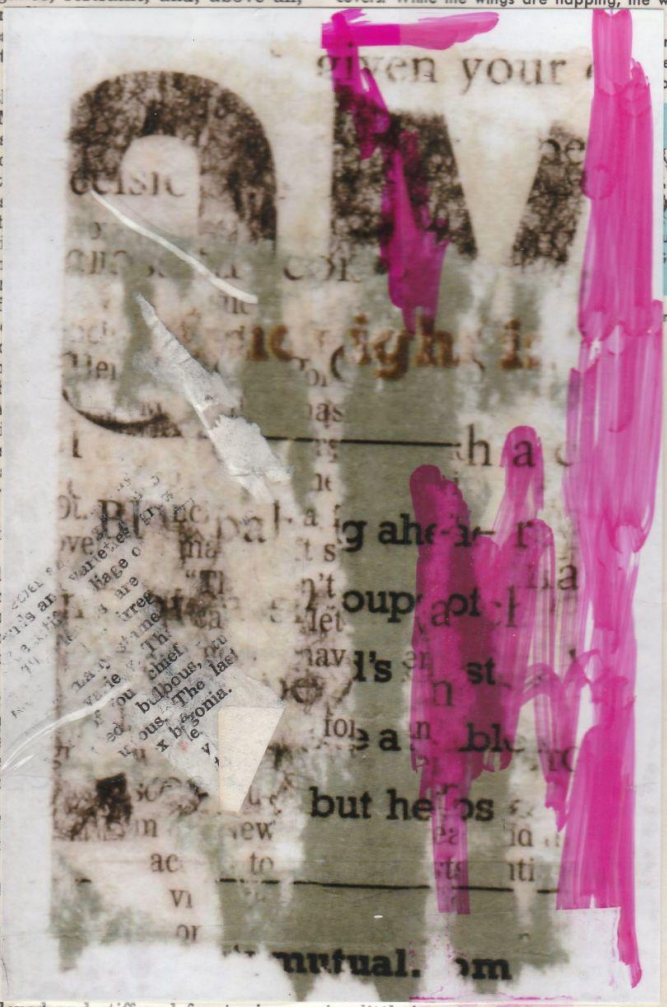
BEETLE



The external anatomy of a beetle is shown above. When the wings are folded against the body, they are concealed by two thick, leathery covers. While the wings are flapping, the wing

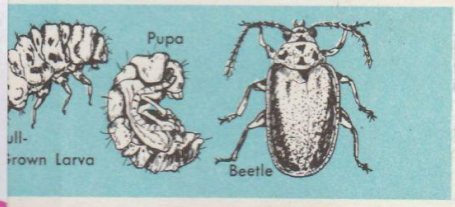
When he was about 28 years old Beethoven became aware that he was losing his hearing. Four years later, in 1802, he wrote the famous "Heiligenstadt Testament," a letter to his brothers in which he revealed that in despair over his growing deafness he was on the verge of suicide. He managed, however, to overcome this despair and went on to write some of the most inspiring music ever written, much of it after he had become totally deaf.

Beethoven is generally considered to be the central figure in the history of music; the significance of his contribution is almost beyond calculation. Music before him, best exemplified by that of Mozart, had been characterized principally by grace, elegance, restraint, and, above all, form



hardened and stiffened front wings ing little insects.

The Japanese beetle is a fruit pest. Larvae of the caterpillar hunter beetle eat caterpillars. The billbug injures grain roots. The striped cucumber beetle eats cucumber leaves. Larvae of the darkling and meal worm beetles damage stored grain. Whirligig beetles, water scavenger beetles, and predaceous diving beetles inhabit ponds. The striped potato beetle and the Colorado potato beetle are pests of potato plants. The relatively large ox beetle and rhinoceros beetle remotely suggest their namesakes. The dung beetle and the tumblebug make dung balls and roll them about. The six-spotted tiger beetle moves swiftly. The wingless female of the tile-horned Prionus bear overlapping plates. The hairy burying beetle, the hairy rove beetle, and the carrion beetle eat decaying animal flesh. Larvae of the elder borer burrow into trees. Larvae of the Buffalo carpet beetle eat and damage wool. If the eyed elater falls on its back, it can flip into the air, turn over, and land normally on its legs.



ny plants; the lady beetle is a helpful insect.

BEGONIA i genus of tropical nts belo ily to a fam of s a out 400 sp and a great num- nging of hybrid varieties, grown ecies heir b foliage or showy adis. The ers are a nate atiful more ular. The flowers are ned an d of grass olor cultiv ated types are of groups: fi- brous root erous, and rhizomat st group includes the re

BAT, a lit…mmal having wings made of s…n the fore-arms and …s and tail. The …, and armed w… have five shor… nails, by which …down, when sl… ally in some da… s go, the wings s… es easily, much as… ery active in the … ngly awk-ward a… he ground. Bats … oughout the world … abundant in warm … ary greatly in size. T… the flying fox of sou… s about 1 foot long a… spread of nearly 5 feet. …e United States are 2… ong and have a win… 14 inches. … of the common bats are mous… ored. It was probably for this r… that in olden times the bat… known as the flitt… use. … bats are re… lark b… black, or … Bats large ear… eyes often hide… faces. … are chiefly … pendir… day in caves… es, or … dark places, … in th… ning in searc… , usual… sects which the… on the … The baby bat … naked … carried about b… other, cl… to the fur on h… ast. She … it and keeps it … m. One … East Indian bats, the naked b… a loose pocket of skin in … whi… baby is held.

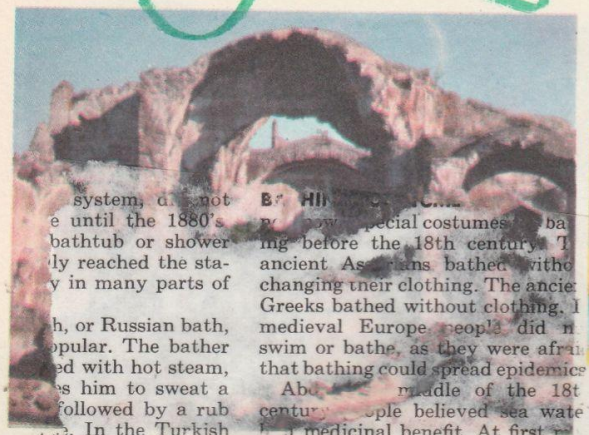
There are … ers … about bats … e … quite ha… … useful … … great… … There are … … mostly in the Old Wo… … stroy fruit and a … th Amer… ica and … and the West In… he flesh of domesti… lap their blood.

BATH, …one's body … in wat… or steam. The pu… largely to remov… although baths … en for reli-gious … simply for pleasur… But in some period… ke baths at all and … e of taking them. …athing was more … lay.

Most … peoples had public baths, … e even had private baths in their homes. By far the largest and most interesting were the Roman baths. These were a little like our swimming po… much … e complicated. The … usu… pool room … ar… oom. After … dressing r…om, … into the warm room …gin to sweat and …h various oils … soap (then …nter the hot r… at pro-fusely … th a special … ter … would t… … sometime… …, a warm ro… and he cou… leaving cold pool. F… …oom … th … a rubdown.

Christians … ese baths for moral… for a time bathing was wide… voided. But in the Middle Ages … every two or three weeks … nd … basins were … In … athing again … religious gr… it that chan… af-ficient … of France, … bath only … great ladies … nd face only …

… England … nded bathing … beaches sud-… bedrooms. … opular. Bathing … ugh there was not … ing or sunbathing. The … bathing grew, and people w… ld afford it even took milk baths.



system, d not
e until the 1880's
bathtub or shower
ly reached the sta-
y in many parts of

h, or Russian bath,
opular. The bather
ed with hot steam,
s him to sweat a
followed by a rub
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ages) the bather
s perspiration in
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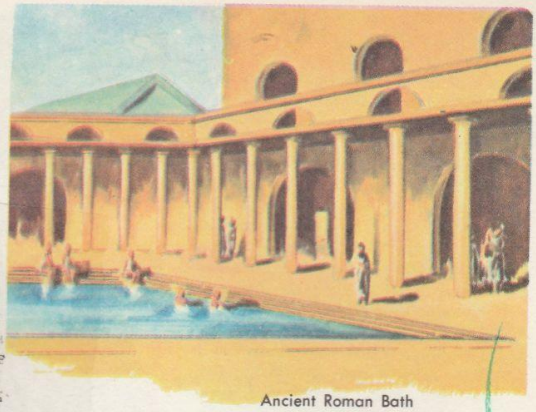
Arth

A modern bathroom affords ease and luxury.
Courtesy of Kohler of Kohler



Ancient Roman Bath

B HI
p ecial costumes ba
ng before the 18th century. T
ancient As ians bathed witho
changing their clothing. The ancie
Greeks bathed without clothing. I
medieval Europe people did n
swim or bathe, as they were afra
that bathing could spread epidemics

Abo middle of the 18t
centur ople believed sea wate
d medicinal benefit. At first m
and women bathed separately
out clothing. A bathing ma
propelled them into the wate
out clothing

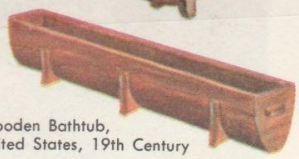
Queen's Terra-Cotta
Cnossus,
700 B.C.

VERY DAY &
MOST OFTEN

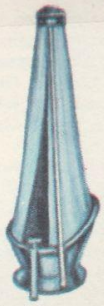
Fre
18th

England, 12th C

French or Italian
Tub, 19th Century



Wooden Bathtub,
United States, 19th Century



Hip Bath

ub, Early 20th Century

Hip Bath with
Shower, 19th Century

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ed, washed,
plunged into cold wate

ATHING COSTUME. There were
no known sp s for th-
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syria ut
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aid
out the aid h
y peo r
had nen
e ba ery with-
ic achine
the bod er with-
ng. During the last part
of the 18th century, women began

and silver, separated by wet pasteboard. This first battery ... impro... a nur... teries... or t... comm... are ... DRY... AGE... T... means... storage cells grou... gether as a single source of electricity. Actually the term is incorrect when applied to a single cell, but it is commonly used in this way. Therefore, when you buy a flashlight battery at the store, though, this would correctly refer to ... probabl...

BATTLE... the earl... particul... foot. K... so used it, ... he two-bla... he wrist b... a pike ati... che ultimat... the club used b... Greek art shows t... was the favorite v... Amazons. It neve... emained so long in ... Ages had it not ... mor, which protect... n everything but hea... the development of gunpowder weapons, the battleax became obsolete.

BAUDELAIRE, CHARLES PIERRE (1821-1867), ... poet, was born in P... completing his education ... was sent by his parents, who opposed his wish to become a poet, on a trip to India. He did not complete the voyage but returned to P... where, subsisting on a small inheritance, he wrote poetry and critical essays and translated the works of Edgar Allan P... by whom he was influenced grea... 1857 he published his principal work *The Flowers of Evil* (*Les Fleurs du mal*), a volume of verse that was immediately banned as offensive to public... and for which Baudelaire was fin... Subsequent editions omitted the six offending poems (illegal in France until 19... but included ... poems.

B...ire's life was filled with spiritual and physical suffering, both the cause and the result of the many excesses in which he indulged. In 1864 he left Paris for Brussels, where he lived in squalor for two years that ended with his complete physical collapse. He was returned to Paris, where he was a helpless invalid until his death 15 months later ...e of 46.

...ms of *The Flowers of Evil* ...anged that they form a ...unit. The theme of the ...e conflict between the in... ...of man and his world and ...toward which he continu... ...es. Baudelaire placed great ...on life's unpleasant, often ...us, realities and probed the deepest recesses of the human soul in his nightmarish search for some sort of absolute that he hoped would ... ...reac... ...ds. "W... ...s of the ... ...at's the ... ...that Uni... ...B... ...reate... stri... ...hose sui... ...and who... ...orbid, his ... ...ship of sce... ...is em... pha... ...of the Fre... ...s abil... ity ... ...with a m... ...his plur... ...have mar... ...and prob... ...the 19th ... ...reat influence on several ... ...ant French poets of the ...ter 19... century and, both directly and through others, had an incalculable effect on virtually all 20th-century literature. See FRENCH LITERATURE; MODERN POETRY.

BAUXITE (from Les Baux, the name of a town in the south of France where it was first found in large quantities) is a whitish-gray clay that is the chief commercial source of aluminum. The bauxite found in nature is more than half alumina, or aluminum oxide. Its other constituents are water, iron, and silica. The difficulty, for many years, was to get the aluminum free from the ore as alumina has a very high melting point (over 2,000° C.), so that it cannot be melted in iron or steel tanks; moreover, it cannot be dissolved by any ordinary reagent.

The American chemist Charles Martin Hall, who invented the Hall process for reducing bauxite and so made cheap aluminum possible, discovered that cryolite, a double salt of aluminum and sodium found in Greenland but now produced synthetically, has the unique property of dissolving bauxite at a comparatively low temperature. See ALUMINUM.

Bauxite is also used in the manufacture of alum and alundum. It is found in several districts of the United States, but principally in Arkansas.

BAVARIA is a former kingdom of southern Germany. It is now a state of West Germany. It is a hilly land with some high mountains and large forests. Germany's highest mountain, the Zugspitze, is in the Bavarian Alps. The principal river is the Danube.

The climate is cool. Winters are cold, and much snow falls in the highlands. Forests, composed chiefly of pine and fir trees, cover about one-third of the land. Rye, sugar beets, potatoes, barley, wheat, and hops are among the main crops grown by Bavarian farmers. Most of the people are Roman Catholics.

This town is located on the pine-covered slopes of the Bavarian Alps. The Bavarian Alps, which offer beautiful landscapes and winter sports, are a favorite vacation area for Germans and people from other nations. Bavaria is an agricultural region. About a third of the land is ...

Courtesy of TWA—Trans World Airlines

Bavaria ... There are ... products ma... include po... optical in... automo... Bava... Ch...

...n 1866. Bavari... p...ent part in the ... Prussian War (1870-1871) a... came part of the unified Ge... Empire that resulted. Howeve... managed to keep a greater degr... independence than did the vari... other member states of the Germ... Empire.

With the end of the German Em... pire after World War I, Bavaria soon joined the Weimar Republic. Munich, Bavaria's capital, became the center of the growing Nazi movement. Separatist tendencies and Bavaria's long tradition of independence were crushed when the Nazis took control of Germany in 1933. Shortly after World War II Bavaria included itself as a state in the newly formed Federal Republic of Germany.

...pping down... two fault zones. The Gulf ... nia and the Red Sea may be such ... areas.

...sharp-... former-... be fixed ...file, thus ...thrusting ... in the ... Tellier, ... in about 1662. ...iers in the Pyre-... knife designed to be ...he muzzle of a musket. ...sed to kill wounded bear ...e was insufficient time to ... musket. By 1690, it had ...ced the pike in all Euro-...

...emely formalized ma-... tactics of European ...onet was used to de-...ttack after the mus-...red in volleys. It ...regarded as France's ... weapon ...l-firing, long-range rifles and ...diminished the importance ...ayonet, since opposing ar-...ght at greater distances ...ch other, and advancing ...attempting to deliver a ...ttack could be cut down ...e rapid-firing weapons. In ... warfare of World War I, ...et was used to a limited ...ent for mopping-up operations ...n trenches and machinegun nests. It was little used in World War II.

In 1870 a woman's bathing costume consisted of a bodice, a full skirt, and bloomers that terminated in ruffles below the knees. High-heeled shoes and hose completely covered the lower extremities, and a hat adorned the head. In 1890 a skirt, long bloomers, and a hat were still worn, but they were somewhat simpler in style. By 1905 the hat and bloomers were outmoded, but knee-high hose still completely covered the legs. Ten years later women were bathing in a sleeveless, heavy-wool chemise extending from the neck to the knees. The diminutive costume of 1961 contrasts greatly with the earlier ones.

to wear a long, loose, flannel bathing chemise.

In the 1860's a costume appeared in which a little swimming was possible. This Victorian costume had an ankle-length skirt and looked like a lady's gown.

In 1887 many sports became popular. For bicycling and swimming costumes with large sleeves and full bloomers allowed freedom of movement. In 1900, although long stockings were still in use, the Victorian gowns were abbreviated. Bathing caps were worn, but they were made of fabric and were not meant for the water.

In the United States in 1 ...llowing the popularity of t... ...th gown, sheath bathing ... ...peared, with short ... ...nd sleeves. They were w... ...dals and stockings.

By the 1920's sunb... ...ll as swimming had b... ...r. The overarm stro... ...freedom than th... ...side stroke. S... ...flected in ...

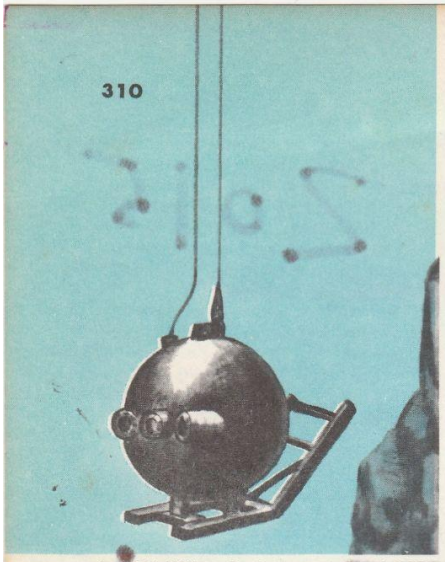
...for such activities as sunning and beach sports. Some styles include bathing suits together with matching articles of clothing, for example, a duster that may be worn separately. A matching skirt often comes with the suit so the wearer can dine without having to dress.

BATHOLITH, a very large igneous rock mass that formed beneath the surface of the earth. Parts of a batholith may be exposed at the earth's surface because the many layers of rock that once covered the batholith have been partially removed by erosion. Batholiths are often composed of granite to granodiorite and are associated with major mountain ranges. By definition a batholith has a surface area of 40 square miles or more. If the same type of rock mass has a surface area of less than 40 square miles, it is called a stock. Some geologists call any large igneous intrusive mass a pluton.

Batholiths are composed of coarse-grained rocks. Batholithic rocks are formed at high temperatures and cool very slowly. While a batholith is forming, the neighboring rocks, called wall rocks, may be greatly metamorphosed, and sometimes are penetrated by hot liquid rock from the batholith. It is probable that different batholiths have come into existence in somewhat different ways. But all batholiths were formed at fairly high temperatures and beneath the earth's surface.

Some batholiths are extremely large. The Coast Range batholith in British Columbia is at least

The exposed rock is part of a batholith. A large batholith located in central Idaho is exposed for over 16,000 square miles.



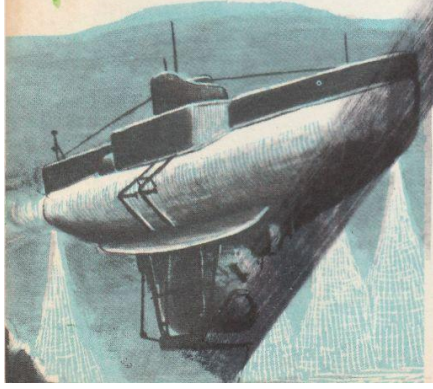
In 1934 William Beebe at a depth of 3,028 feet explored the ocean off Bermuda. At these dep see many fish with fanta mouths, large eyes, or lu

1,000 miles long and wide. Other large ba posed in the Patago Idaho, and in the

No one has ever parts of a batholith. tain how far bathol ward the earth's ce not more than a few or what is the shape roots.

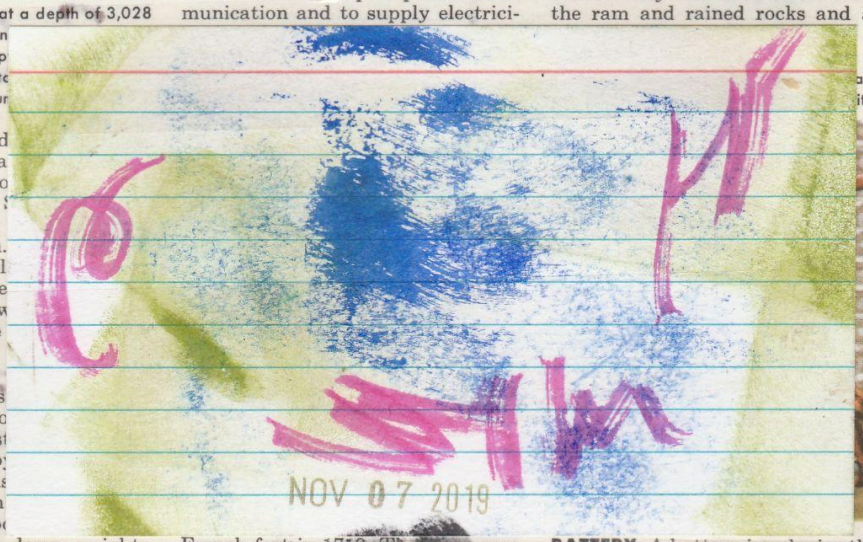
BATHYSCAPHE, a s deep-diving craft fo ploration. It consist sphere suspended b of light fluid such as operated in depth in lar to that of a ballo line is released to go down; weights are dropped to go up. Power for lights, propulsion, and special equipment is furnished by a storage battery. Auguste Piccard and his son Jacques are largely responsible for the successful development of this research vehicle.

In 1959 Andreas Rechnitzer and Jacques Piccard went down to 18,600 feet in a bathyscaphe in the Marianas Trench off Guam.



BATHYSPHERE, a spherical steel chamber with a quartz eyeport used for deep-sea observations. It has room enough inside for two persons with lights, cameras, and other equipment for recording data. The bathysphere was designed by naturalist William Beebe and Otis Barton. Beebe reached a depth of 3,028 feet off Bermuda with this device. Modern steels enabled the U.S. Navy to reach a depth of 38,500 feet in 1960. Oxygen for breathing is carried, together with special chemicals to remove carbon dioxide and moisture from the breath.

The bathysphere may be supported by a special cable with wires from a mother ship to permit communication and to supply electrici-



French fort in 1719. The name was derived from a reddened post placed near the site by Indians to mark the boundary between the territories of two tribes. The city became the state capital in 1849. After the Civil War Baton Rouge became a great commercial, rail, and shipping center.

BATTERING RAM, an ancient military engine for battering down walls. It consisted of a strong wooden beam at one end of which was a mass of iron, usually molded into the form of a ram's head. In its earlier form it was carried in the arms of men who ran with it to hit the wall. Later the ram was suspended from a beam placed on uprights, so that it could be swung to and fro. This required much less manual labor, and it had much greater mechanical force. Some of these rams had beams 100 to 150 feet long, with iron heads weighing 2 tons, and required a hundred or more men to swing them. By repeated blows from such an engine the part of a city wall attacked would in time be weakened and would finally fall with a crash, giving access to the besiegers. In its later form the battering ram was covered by a shed. This type, designed to protect the soldiers working it from the arrows and darts of the enemy, had a ram worked by ropes passing over pulleys. When the walls of a castle were attacked by a battering ram, the defenders hung out heavy pads, made of hides tied together in bundles, and wooden shields to lessen the force of the blows. They also tried to set fire to the ram and rained rocks and ar-

aken
ities.

BATTERY. A battery is a device that furnishes electric current. The first electric battery was developed by Alessandro Volta around 1800. He was led to the investigation of the nature of electricity by certain experiments performed by Luigi Galvani. Galvani had shown that when one of the nerves of a freshly killed frog was touched with a metal scalpel while an electric spark was produced on a nearby friction machine, the muscle of the frog twitched. The same effect could be produced by two pieces of metal, one of which was placed on the muscle of the frog's leg and the other on a nerve. Galvani attributed this to "animal electricity." Volta showed that this effect was not due to any "animal electricity" but was caused by the presence of two different metals. He proved his point by showing that electricity could be generated by two different metals, such as zinc

it possible for them to wound an… the bigeye capture Bass during an atte… well as for bank robbery on July 19… rawberry Bass died of his w… names later on his 27… ie and

BASS, a pi… very ber… of sev… bass spiny-rayed… th fish that grow… no jority are me… Serranidae, the… clude the stripe… bass, and the roc… the coastal wate… lf of United States: the … from the Gulf of M… sea bass, the kelp … ba… the spotted b… stri… d bass from the c… ne of California. The fresh… Eastern cies of the sea bass fam… nsplanted to the white bass and the ye… West and even to which live in various part… ntinent—Africa. The eastern half of the United … outh is most often found in

Largemouth

allmouth

Th… eyes, whereas the jaws of… fresh-water game fish.

co… d sluggish streams; th… , in cool rocky- m… y-bottom lakes in …ited States and in …ams of the Middle

th… m… ri… er… th… Oboe and Bas-

na… med and captured by a la… b reinforced by a few th… nsed by the death of 98 of… mob then murdered the re… nd the mayor of Paris. m… 75… po… kn… we… kn… po… po… in… we…

th… di… th… na…

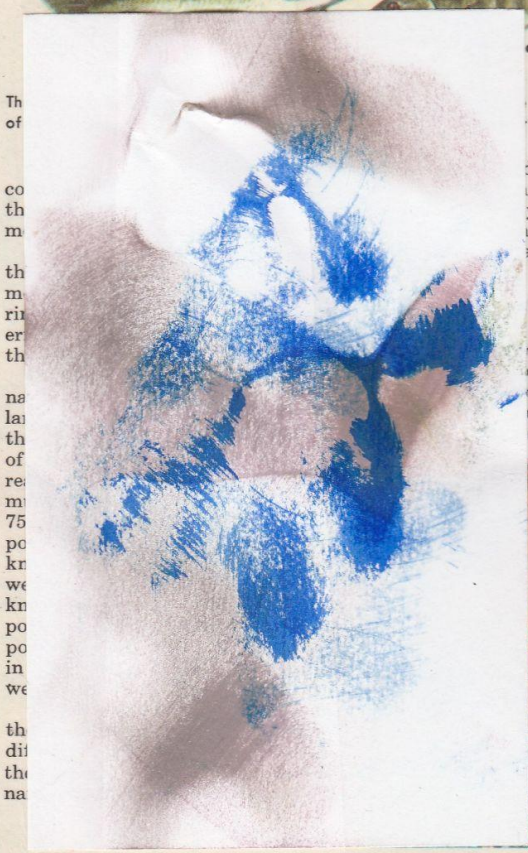
The large light-green leaves of the American basswood are lined with prominent veins.

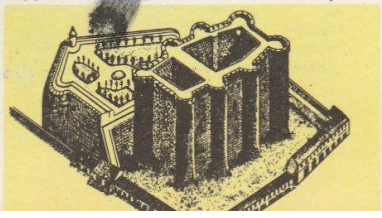
BASSWOOD, a tree closely related to the linden tree and often called linden in certain parts of the United States. It is a tall, straight tree with a tapering trunk, dark-gray fissured bark, and heart-shaped leaves. The fragrant yellowish-white flowers are attractive to bees, who from the nectar make a superior honey.

BASTILLE, a famous prison in Paris. During the ministry of Richelieu, and under the worst of the kings, people were often seized and shut up here. They were never told their offenses and were treated with great cruelty. On July 14, 1789, the Bastille was surrounded by a violent mob. The people armed with guns and cannons, stormed the Bastille, released the prisoners and demolished the building. This event marked the beginning of the French Revolution. A column stands on the site of the Bastille.

BASTILLE DAY, a national holiday of France, is celebrated on July 14. It commemorates the taking of the Bastille on July 14, 1789. Since 1889 that day has been known as the *Fête Nationale*, because the taking of the Bastille is considered the beginning of French independence. There is open-air dancing in public places; there are parades and fireworks. This French holiday is almost the same as the U.S. Fourth of July.

The Bastille was a fortified prison where opponents of the government were once kept.





BASS, SAM (1851-1878), a desperado who, with his gang, robbed stagecoaches, held up trains, and terrorized the western territories. Bass was born near Mitchell, Ind. He left home when he was 18 years old and worked in St. Louis, Mo., Rosedale, Miss., and Denton, Tex. During his first four years in Texas, Bass was industrious and was a good citizen. In 1875 [illegible] herds. After this, he and his followers held up a Union Pacific train in Nebraska. Their loot from this robbery totaled about $65,000. Later they robbed four trains in the Dallas-Fort Worth, Tex., area. Bass and his gang were for many years high on the Texas Rangers' list of most wanted criminals.

A former companion of Bass's was planted in his gang as a spy by the Texas Rangers. Information relayed [illegible] this agent to the Rangers made

Many early peoples were fine basketmakers.

BASKETWORK is the art of making containers and mats by interweaving plant stems, leaves, or fibers. It was one of primitive man's earliest and most useful handicrafts.

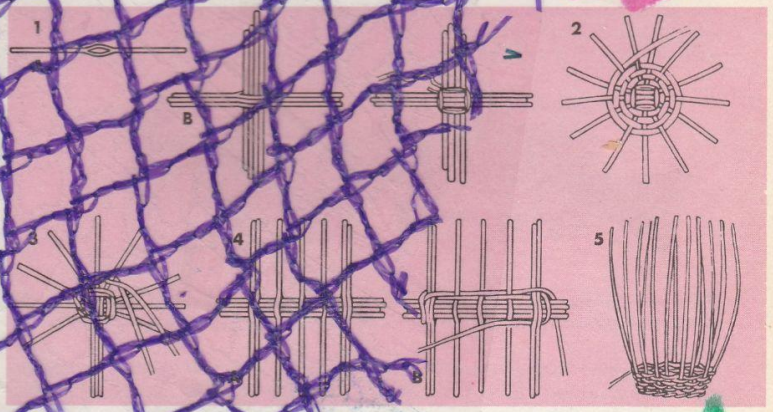
There are a number of different materials used in basketry: rattan, reed, raffia, rush, straw, hemp, willow twigs, cattail leaves, cornhusks, straw, bark, and grasses of all kinds.

The tools a basketmaker uses are a sharp knife, a strong pair of sharp shears, an awl or large knitting needle, a measuring tape, and a pail for water to moisten and soften the materials being used.

The spokes of a basket or mat are the [illegible] or upright pieces that form the framework. The weaver is the material that is wound in and out between the spokes. The spokes are usually stronger and less flexible than the weaver. The more spokes a basket has, the sturdier it will be.

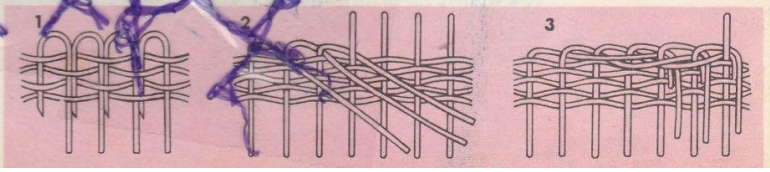
Basketwork can be made more artistic by combining different weaves, by using different styles of borders, or by coloring the reeds. Reed comes in its natural color, but separate strands can be colored with [illegible] dyes before they are woven. The reeds should be soaked first in water and then in concentrated dye solution until they become the desired color. Different-colored reeds may then be interwoven and interesting patterns formed. The weaver, for instance, may be of one color and the spokes of another.

A basket or mat may also be painted after it has been completed. Before a [illegible] finish is applied, the completed object should be singed over a flame in order to remove any [illegible] fuzzies. Wood stain, enamel, [illegible]sh, wax, shellac, or lacquer may be used.



The under-and-over weave, 1 below, is the simplest; it is done with one weaver and an odd number of spokes. The double weave, 2, is the same, except that two weavers are used at once. The pairing weave, 3, is done with two weavers and either an odd or an even number of spokes. Three weavers are used for the triple-twist weave, 4. When the end of a weaver is reached, simply join another with it by crossing the ends behind a spoke, 5.

To make an open border, 1 below, trim the spokes even, cut them to a point, and push them down into the weaving. The close border, 2 and 3, is suitable for large and heavy baskets. Allow 6 to 8 spokes for each spoke end; pass each end in succession behind the one to the right, 2, over the next two behind the third, and down into the weaving, 3. When the ends have dried, trim them just inside and close to the border.

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was chairman of the War Industries Board. He then was economic adviser to the American Peace Commission and a mem... Supreme Ec... was con... tal a... (19... indus... ing W... mittees ... age, manpower, ... and postwar adju... drafted U.S. policy in... Atomic Energy Commissio... 1946-1947. He was decorated by ... United States, France, Italy, and Belgium. He endowed hospitals and medical schools.

Natl. Park Service

The cooling of basaltic rock during volcanic activity formed the columns shown above.

BASALT, a tou... igneous or vol... dirty brown, ... black. It is oft... way that it app... of columns, as... Scotland; the ... Ireland; on the ... rior; and the P... son River. It is ... uted, being fou... the world and ... ties. It belongs ... opposed to "aci... Basalt usually ... ognizable qua... principally of ... spar, pyroxene ... ore. Some ba... bende or bioti... tain olivine. Th... basalt are usual... seen only unde...

...lt, an igr... ...cause of ... basal... ...of the ... ...ic ve... ...basal... ...in the ... ...late...

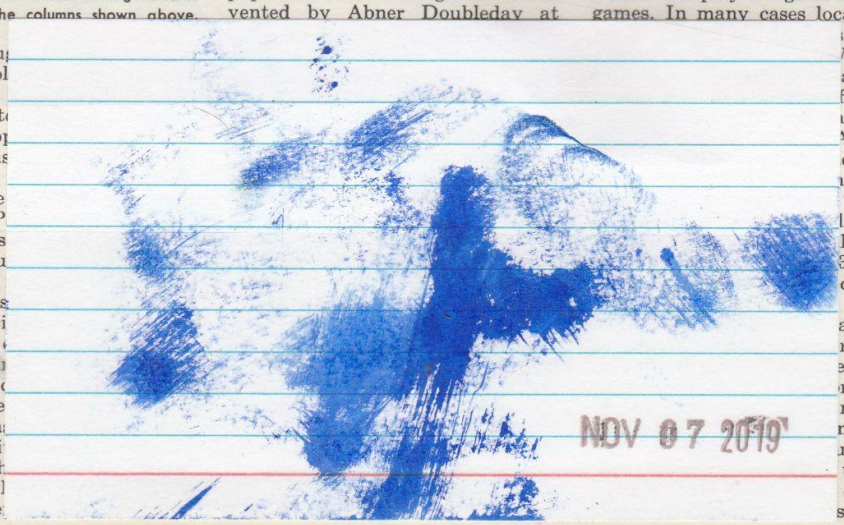
...layed by two ... in which a ...s are used. ...e of the ...s millions ...rks each ...recent years ...me popular in ... America, Mexico ... and Japan.

...ne is certain of the origin of the game. According to the most popular tradition the game was invented by Abner Doubleday at

suit, and the first professional baseball league—the short-lived National Association of Professional B...seball Players—was fou... 71. The National L... ...ex-istence ... ...by ... ...n. ...e ...orbed ...rful National result, the National ...minated the professional-...scene between 1892 and ...900 the American League ...d upon the disbandment ...tern League. See AMERICAN; NATIONAL LEAGUE.

...es, ow... ...mino... ...extent, serv... an imp... the source of, ...ov... ground for, major-league p... The minor leagues date from the estab...shment of the International A...on in 1877. By 1884 there ... minor leagues in opera... ...to protect themsel... ...etition of the maj... ...mulated the N... ...his establ...sl... ...aser ar...ge-me...jor and the mi...onal Agree-ment... 1901 the minor ... Nation-al Assoc... Base-ball Leag...ational Agreemen...oday the minor leagu...ned accord-ing to geog...d population limitations.

Outside th...ince of organized baseball the... are thousands of teams that play a regular circuit of games. In many cases local teams ... and in... ...Virtually ...ams that ...fessional ...rticipate ...American ...d similar ...g been a ...The first ...layed be-...liams in ...32. How-...d of 13 ...aseball is ...r of base-...executive ...residents ...merican ...ner from ...ues. The ...the club ...over all ...s. In case



might offer a ...icy ... in exchange for a typewriter. A ...ost everyone has bartered marb..., books, or other things at some ...ne.

One of the ...ost fa... ...examples of barter was the purc...se of Manhattan Island ...tle in ... Minuit in 1626. He b...ught ... Island, which ...s then co...ha...es, ...st, from ...e Canarse... ... ... The price was $24 in trinkets ...

Barte... was o... ... the earliest ...rms of trad... ... it is still used ...among ... peoples. It is not difficul... ... see how barter began. Suppose ... ... a ... saw someone th... ... village with a splendid fish net. A fish net might be something that he needed but did not have ... ... patience or skill ... But ... might have in hi... ... several well-designed ... owner of the fish... potter might ... obtain the ...

Barter ... villages ... Africa ... left on ... area. Oth... ucts. They ... goods of their ... This type of bart... barter," because ... argues about the pri... exchange of goods. Of ... tribes must be equal in st... that one could not cheat th... by taking the goods and ... nothing in exchange.

Money exchan...

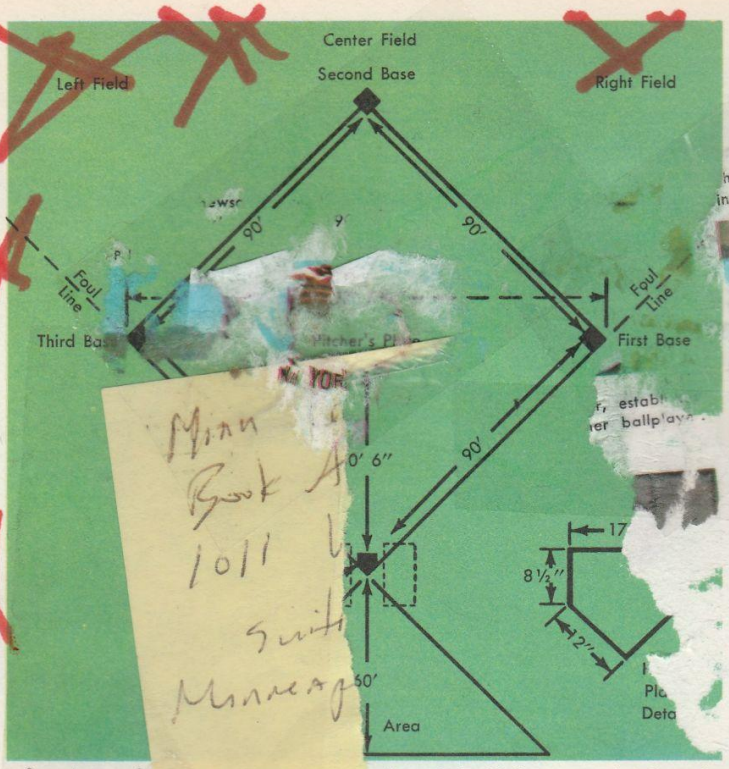
garian Musical Academy o... pest instead of following the usu... custom of going to Vienna. He was professor of piano at the academy ... the *Miraculous Mandarin*, six quartets, and songs and piano pieces.

BARTON, CLARA (1821-1912), ... of the American Red Cross, ... grew up in Oxford, ... several chil... older ... ...t ... n, ...h- ...ent

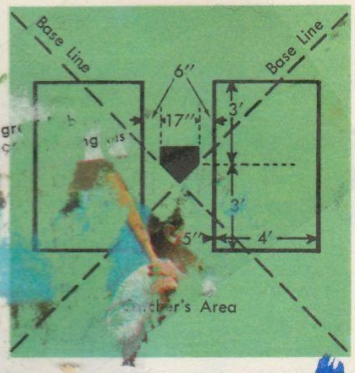
War en- Union ...cester, ...es and ...bution. ...ere most ..., she re- ...o engage ...ivities at ...rcefulness, ...ided many soldiers.

After the ... ...t to Europe, and while there ... ...arned of the ... ...ss, which had ...1864 by a treaty ... States was not ... to observe the ...tion during the War (1870-1871), ...ed in relief activi... ...urn to the United ...a campaign for the ...an American Red ... campaign ended ...82, she was chosen ...new organization ... most impo...tar... ...e Red Cross, ...the ...t in America, wa... ...the interna...ona... ...so-called A...neri... ...which pro...vide... ...rk in peacetim... ...s in war ...ne. A... ...caused ...er ...to ...RED CROSS.

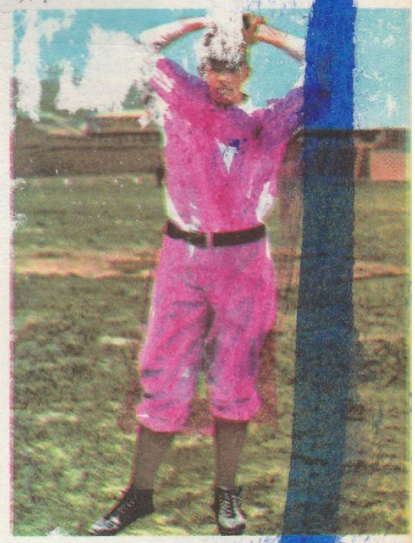
...RD MANNES ... States financie... ...viser, was bo... ...n 1889 ...he v... ... Colle... ...of ... He wo... ...m, jo... ... Exchan... ...y his s... ...promoti... ...es in sulfu... per, and synthetic rubber. I World War I he served in s... government advisory groups



Above is the 90-foot square that forms the infield of the baseball playing field. To the upper right is the home base.

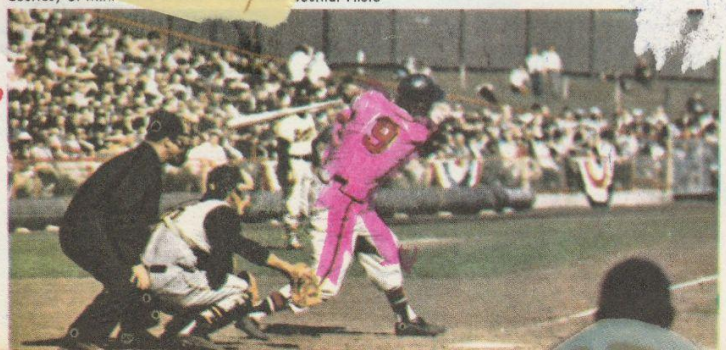


Christy Mathewson pitched an average of 23 wins each year from 1900 to 1916. UPI



The great Babe Ruth batted in 60 home runs in 1927, bestir[ring] his record of 59 in 1921. UPI

Ty Cobb, a fiery competito[r] [who] lished more records than any oth[er] [play]er. UPI



Courtesy of Mi[nn.] Journal Photo

additional players have been elected to the Hall of Fame. The museum also honors men who have made an outstanding contribution to the game in other ways. This group includes umpires, managers, and baseball executives.

The annual World Series, the climax of the baseball season, has become a classic among American, and world, sporting events. (See WORLD SERIES.) Another highlight of the season is the All-Star Game, a contest in which the major leagues field teams composed of their best players. The primary purpose of the first All-Star Game was to promote Chicago's Century of Progress Exposition of 1933. Other innovations that have since become accepted as part of the institution of baseball are night games, spring training, the so-called ladies' day, and, of course, radio and television coverage of the games.

RULES

Organized baseball is played according to rules recognized by the Professional Baseball Official Rules Committee. This committee must accept any change in the playing rules before it becomes official. (The playing rules of organized baseball can be found in the *Baseball Guide and Record Book*.) During the course of a game the controlling officials are the umpires, whose decisions are final.

The object of the game is to score runs. The regulation game is nine innings, but if the score is tied at the end of the nine innings the game is continued by full innings until the

Above is some of the equipment used in ... glove; 3, fielder's glove; 4, bat; 5, ball; ... store in a cool, dry place. A soiled glove ... season should be rubbed with linseed oil ... should be away from the ball when ... and dry. Shoes should be brushed ...

...er's glove; 2, first baseman's ...her's mask. Gloves should be ...ith saddle soap ... in a dry place. The ...ball should be kept clean.

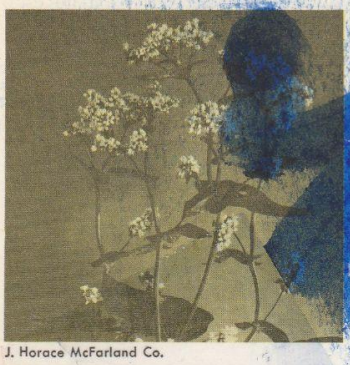
tie is broken. A run is scored ... a player reaches home plate ... after advancing around all ... Each team takes a turn ... continues batting until ... the field has put out ... men batting. That ...ning.

...and misses; and ...t is not caught ...of these count ...

...f he is tagged ...nsive player ...is out if he ...ball while run... bases. A base runner ...e does not follow the ...hs between the bases. ...ay occurs when two ... put out on the same ... triple play, by which ...yers are put out, is ex...are.

...r can get on base in several ways. If he is hit by a ball, he ... automatically ...e base. If the pitcher throws ...alls" before throwing three ... the batter is awarded a ...walk and goes to first base. He is also given a walk if the catcher interferes with the swing of the bat. If the batter hits a ball anywhere between the foul lines out of the reach of the fielders, he may run to as many bases as he can reach before the ball is returned to a base. If he

...t crosses the ...ing hit (the ... the width ... knees and ...)—if the ...it, it is a called strike, that is, called by the umpire; (2) a pitched ball that the



J. Horace McFarland Co.

Bees love the nectar of buckwheat flowers.

BUCKWgrain fro be which buckw is made bu uck- wheat d." It ha opo in- ship w ith whe another grains o the g lo fam ily. B gs to busame famil and, so wh The buck s an a wh with a sle g stem. beows 2 to 3 feet tall and is ofte tre ed with purplish red. The on rs, which hav the vary from bea purplish r slender, m buckwheat grain, which is usually about ¼ inch lon three-cornered, starchy se os- ing shiny brown or

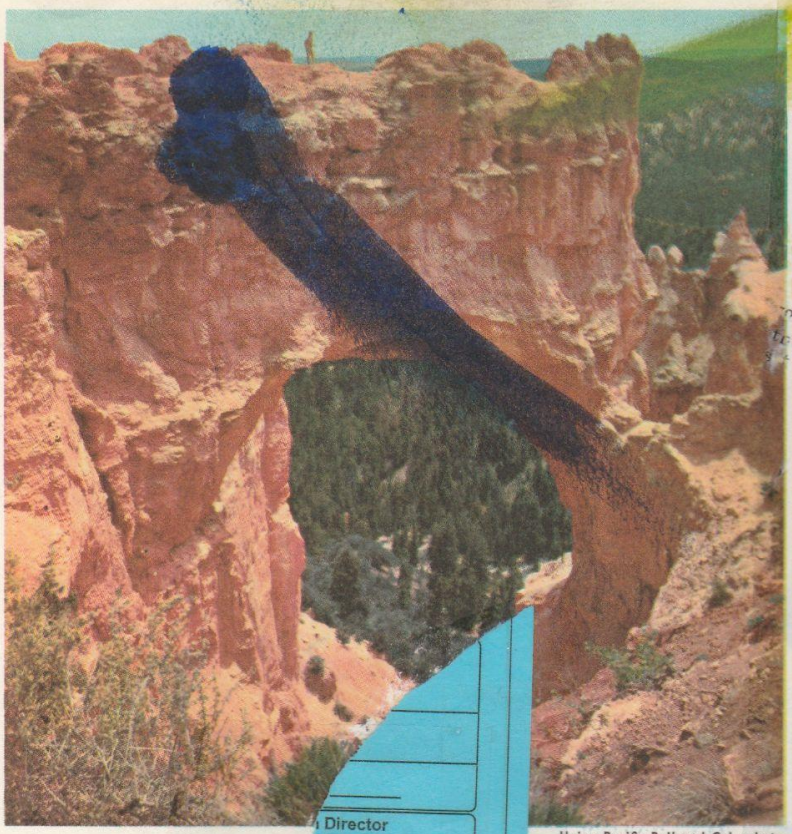
Buckwheat is cut and is threshed. Buckw sed for buckwheat pa ade from the white in the grain. Buckwheat stock food is made from t rtion. In Japan macaro from buckwheat flour.

Buckwheat is supposed to have originated in Asia and to have been carried into Europe during the Mid- dle Ages by way and Russia. It was br from Europe. In it is raised as a g New York and high broken land, mos er grains would not do so wel Since it is often used for planting after other crops it is a convenient crop for t . The plant does well o which is a point in its fa

The uction in the United S only about 2 percent of p. The flow- ers yield a of nectar.

The word s from two Anglo-Saxon w aning "beech- wheat." The p is so named be- cause the grains are shaped much like beechnuts.

BUD, a protuberance on a stem or branch that will develop into a new stem that will bear a leaf, a flower, or both. Buds are produced by both angiospermous and gymnospermous plants. Buds usually form on the stems and slender young bra of trees and bushes rat their thick bra Herbs also an im into so One ty will dev bear onl bud will ars only d, called into a ste d flowers. k much a d has unfol at that an ether it will ars leaves, flo es, such as t y one type of b beginning grow r both leaves an Buds are classifie position on the bud at the tip of a rminal bud. Fron e twig grow further. Buds on the side of a twig or branch are called lateral buds. They are usually smaller than terminal buds and different in shape. Lateral buds that form with- in th leafstalk and a tw ary buds. ung parts of flower are lum the bud tective scales. these parts idly. During spring the burst open hat bear or three s of the during They mall, late een the eir g tropical d do not have es. Neither do the annual herbs of the Tem- perate Zones. The leaf and flower buds of annual plants and of some perennials complete their growth during one spring and summer and never lie dormant in winter.



Union Pacific Railroad Colorphoto

The Natural Bridge is one o… Canyon National Park in southern Utah. Rain, frost, and …rms in the park.

Pa., Apr. 23, 179… from Ireland to this … His mother was th…ner farmer in Pennsy… graduated from D… in 1809 and beca… lawyer, but he re… at the age of 40 … ber of the Pen… when he was o… six years later … gress, where … before he wi… was sent b… minister t… Leningrad … was elect… Senate. … was seci… and unc… minister … He was … States fr… was succe… The rema… on his far… Lancaster, …

REST is the capital and chief … Rumania. It lies on the …rita River on a fertile plain … north of the Danube River. …st is the commercial and …al center of the country. …its many manufactures are …ery, electrical products, …ls, and various food pro… Railroads and highways con… …n the city. It has about …00 inhabitants.

…old town stands on the right …f the river. The newer part …city, with the business sec… …ands on the left bank. Bucha… …s several fine public parks …ny notable public buildings, …ng the former royal palace, …ational theater, and the …eum. It has a large university …d in 1864.

…harest became the capital of …nia in 1698. It was fought … by the Serbs, Russians, and …ns for almost 200 years be… …t became the capital of

Rumania in 1861 … was occupied by the Ger… 1916 to 1918 and fr… .

BUCKE… …HESTNUT AND BUCKEY…

BUCKS… …tanned skin o… …lle… buck, and no… …of a fine grade o… …rom sheep-skin. It … …ish, or gray- …oft. …dressing the …kin by f… …all the rough …Harts are … …oothed. The skin is c… …ed full of a mixture … …w, then laid aside un… Finally it is rubbed … …til it is soft and pli…

Bucks… …ed for mak-ing glov… …g silverware and jewe… …bbing furni-ture. Mo… …ed chamois, or shamm… …is buckskin, not the sk… …mois as its name wo…

In old … …ousers were often ma… …n and were therefore … …ins. Riding pants … …ckskins for the … …when made of w… …se the soft, smoo… also called bucks…

Museum … Heye Foundation

These bu… are the wo… Apaches. Le… up by a be… Both men and women wore leggings.

Indians made use of the skins of all types of animals. Buckskin from the deer was used throughout most of North America. It was a trading asset. The preparation of buckskin was a long process and demanded skill.

gets only to first b... the hit is a ...if he... ...d, it is a ...if... ...it is a ...and ... ...back to ... ...with a ...home run whe... ...he hits a ... ...the park. A runner may ... ...ang the bases when a b... ...ing him to the plate gets a hit, when he steals a base, or when a sacrifice hit is made. A sacrifice hit is one that usually results in a putout of the batter but enables the base runner to advance. An error in baseball is an imperfect play by a defensive player; it allows the base runner to advance or prolongs the life of the base runner or batter.

Little League baseball was ...unded by Carl ...tz of Williamsport, Pa., for the ...nefit of youngsters under the ... of 12. After World War ... at ... movement spread rapidly to ... ...s of the country. There are now ... ...gues in every state, in Canada, ... to Rico, the Panama Canal Zone, ... Cuba, and the Philippines. A Little League World Series is played every year in Williamsport. The American Legion sponsors the American Junior League, a program of baseball for boys from 16 through 17 years of age. Begun in 19... at Indianapolis, Ind., there were ... than 19,000 teams in the ... in 1958 with about 250,000 ... participating. Several major-le... players got their start in Ame... this ...egion baseball. In 1952 the ... ...th League was organized in ... ...ured the ... N.J., to provide baseball e... ... made fr... for boys between 13 and ... of the ... of age. Each of these league... ...ds an annual championship se... ...—the Legion series in Indianapolis and the Babe Ruth series in Trenton.

BASES (ch... BASES.

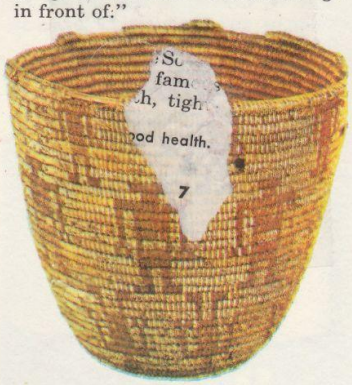
Below are ex...

BASIC ENGLISH was devised by Charles Kay Ogden to serve as an international auxiliary language. The term *basic* stands for *British American Scientific International Commercial.*

The vocabulary of 850 standard English words includes 600 nouns, 150 adjectives, and 100 words for operations. These 100 words include verbs, articles, conjunctions, and prepositions.

Th... are rules for putti... the words ...ogether so that they ... all the w... of a ...anguage wit... many more ... People who ... not speak ...lish h... ve learne... ...se Basic ... ...ic ... month.

As a ...pic, ... is ho... ...asic English. ... ... fou... ...rbs. For *ente...* ... into. *reak* is "go a... *Contract* (a disease) is "go down with." *Precede* is "go in front of."



Denver Art Museum—Dr. Block Color Productions

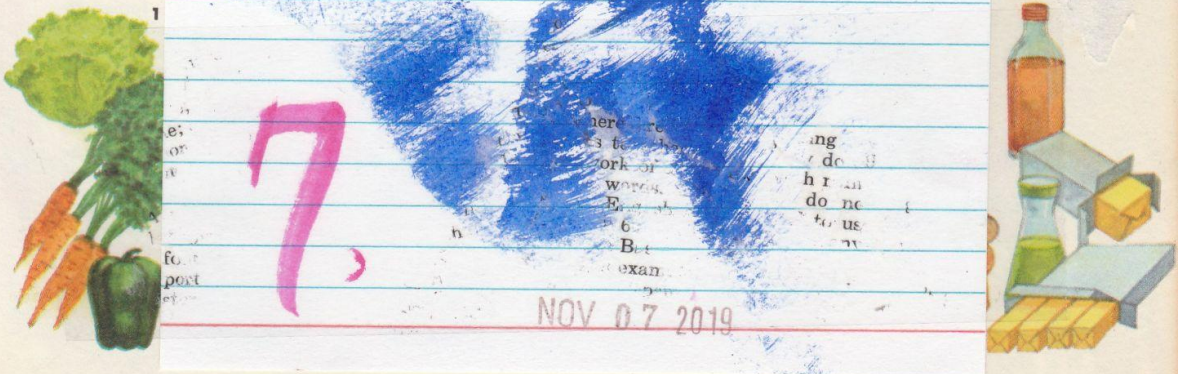
This Klikitat Indian basket is decorated with stylized figures of human beings.

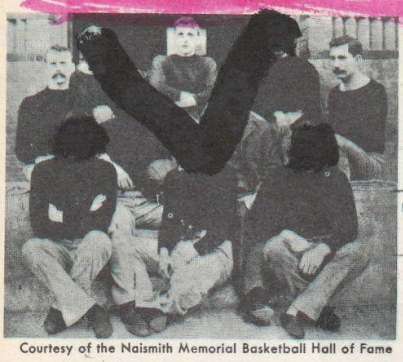
BASIC-SEVEN FOODS are foods ... tables; (2) ... ...s and other foods high ... ...ne acid; (3) other vegetables and fruits; (4) dairy products; (5) meats, poultry, fish, dry beans, peas, nuts, and eggs; (6) bread, cereals, and flours; (7) fats and oils. Something from each type of food should be taken daily. These foods may be used in a variety of combinations.

BASKET, a woven container, generally of wood or vegetable fiber, for carrying, storing, and even cooking. Many baskets made by primitive peoples are so beautiful that they are kept only for their decorative purposes.

Basketry is one of the oldest arts, probably older than pottery making. In fact, pottery making may have come from basketry when primitive men da... baskets with clay and then bu... off the basket frame in firing th... Basketmaking is one of the ancient arts that s... ...ll ...rri... chiefly by hand and ... early date reached a st... ...e of perfection in terms of utility and ... uty that is unsurpassed today.

Bas... ts are ma... ...d over the world ... ...m lo... mat... ...ls. In England so ... ...portant is the basket industry that ... ...ers—a species of willow—are cultivated intensively in well-... ...ed ... Osiers are crossbred to m... ...onger and lighter baske... ... the baby Moses was hidden ... ...e riverbank in a basket ... ...laubed with slime and pit... ...ushes were prob... ...bly papy... ...gyptians made boats ... ...t. In the Middle Ages ... Nativity scene pictu... ...ant Jesus as lying in a ... ...et. Swedish baskets are ... ...ir-





Courtesy of the Naismith Memorial Basketball Hall of Fame

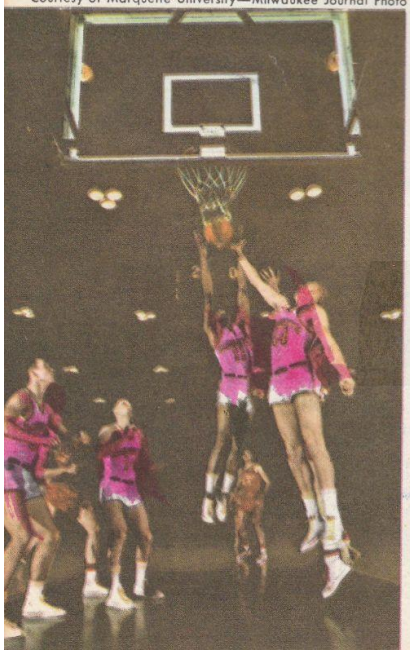
Basketball's first team was formed in 1891.

Courtesy of the Naismith Memorial Basketball Hall of Fame

An early team aims for the peach basket.

Basketball is a fast game in which teamwork, speed, and agility are basic. The action of the game below focuses on the basket.

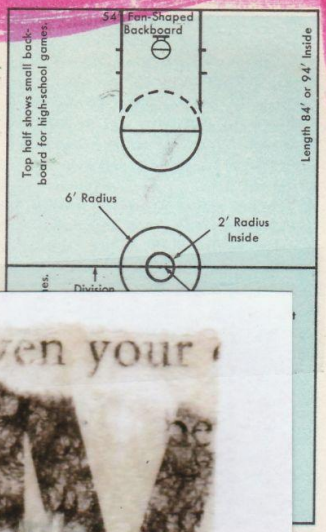
Courtesy of Marquette University—Milwaukee Journal Photo

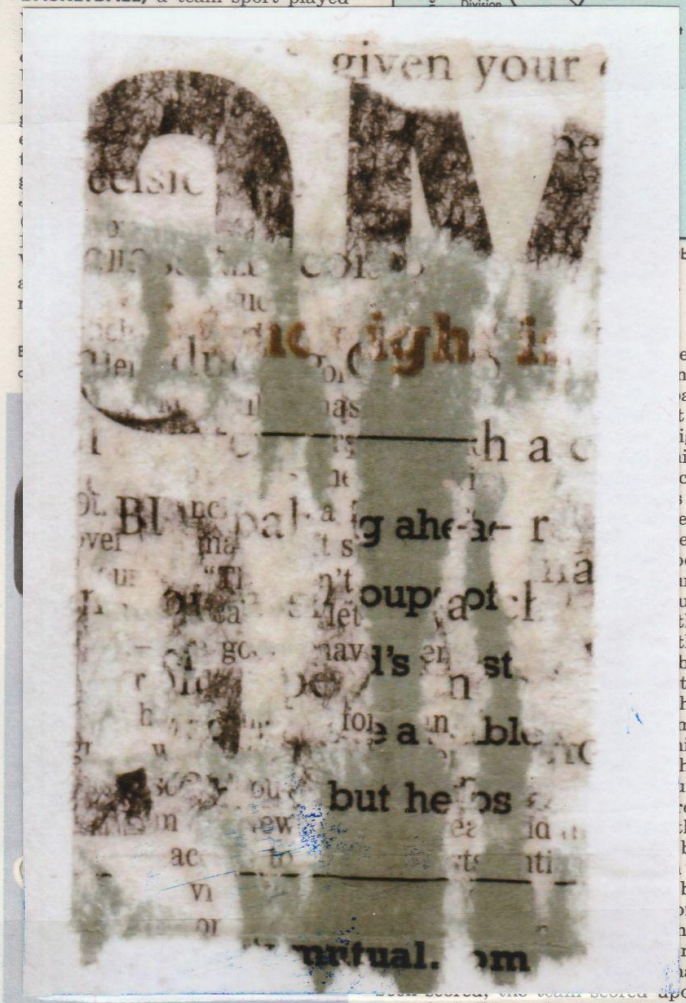


ness, and beauty. Into their cooking baskets, stones hot out of a nearby fire are dropped to boil stew. They even decorate these baskets with religious symbols.

Basketmaking can be a challenge to anyone who wishes to match his skill and artistic sense against those of his ancestors of thousands of years ago.

BASKETBALL, a team sport played





ball

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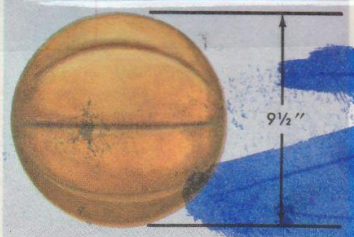


puts the ball into play from that end of the court. The officials are the referee, umpire, two timekeepers, and two scorers. The game is divided into four 10-minute quarters for amateurs and four 12-minute quarters for professionals. There are several other differences between professional and amateur basketball rules.

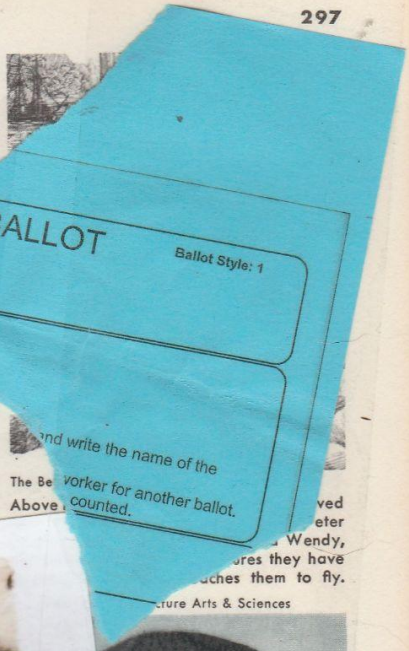
BARREL, a round vessel, sometimes bulging in the middle, that is longer than it is broad. Wooden barrels are made of staves bound together with hoops and have flat ends of equal size. Barrels and kegs may also be made of a metal such as aluminum or steel.

The U.S. standard measure of capacity of a barrel is 31½ gallons of liquid and 105 dry quarts.

The craft of making barrels is known as cooperage. It was known and practiced by the Romans. In the construction of a barrel, the cooper fastened together curved staves by means of hoops; each stave was widest [illegible] and tapered toward the ends. Now usually made by [illegible]

Photo, Beresford

[illegible]ish writer, is shown above. [illegible] he was far more interested in sports than in school, though he loved to read.

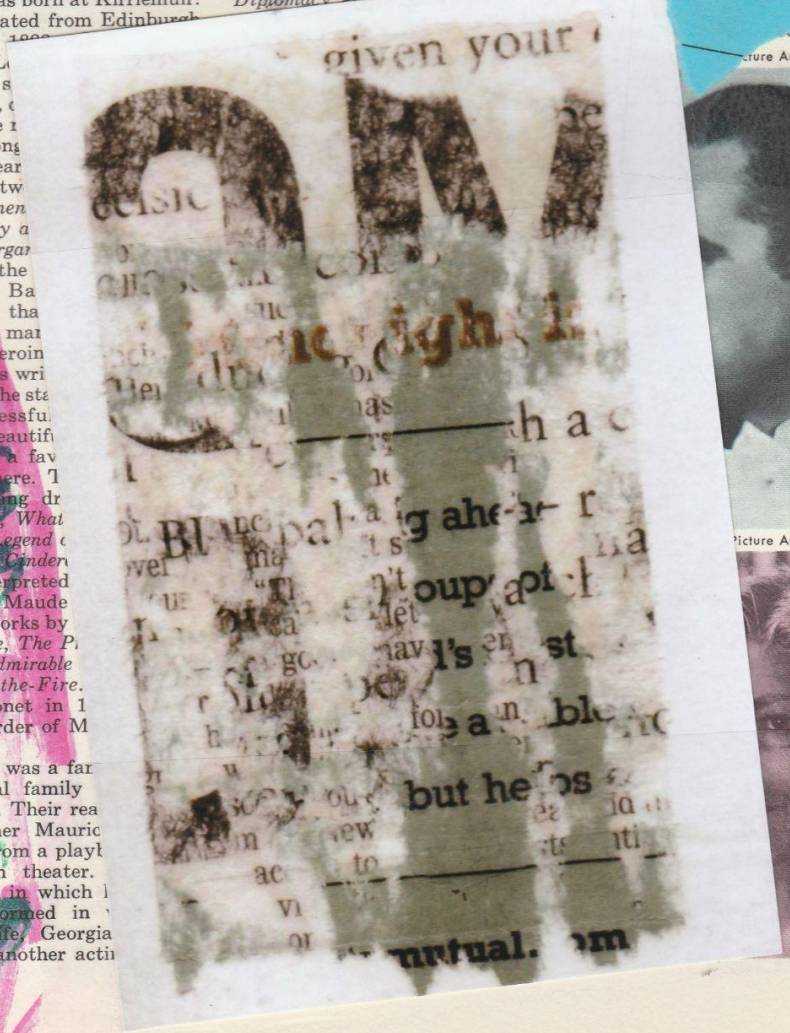


The Be[illegible]
Above [illegible]

BARRIE, SIR JAMES MATTHEW (1860-1937), a Scottish novelist and playwright, was born at Kirriemuir. He was graduated from Edinburgh University in [illegible] journalist in L[illegible] fame for his s[illegible] Scotch village, [illegible] ings under the [illegible]

His first long [illegible] *Minister*, appear[illegible] followed by tw[illegible] novels, *Sentimen[illegible]* sequel, *Tommy a[illegible]* he wrote *Margar[illegible]* tiful story of the [illegible] from whom, Ba[illegible] learned much tha[illegible] books. Under mar[illegible] pears as the heroin[illegible] one of Barrie's wri[illegible] rie turned to the sta[illegible] several successfu[illegible] which, the beautifi[illegible] *Peter Pan*, is a fav[illegible] dren everywhere. T[illegible] of his charming dr[illegible] *Quality Street*, *What Knows*, *The Legend* [illegible] *A Kiss for Cinder[illegible]* lightfully interpreted [illegible] ican stage by Maude [illegible] well-known works by [illegible] *Lady Nicotine*, *The P[illegible] Story*, *The Admirable Alice*, *Sit-by-the-Fire*. [illegible] made a baronet in 1[illegible] ceived the Order of M[illegible]

appeared with him in such plays [illegible] *Diplomacy* and [illegible]



BARRYMORE was a far[illegible] can theatrical family [illegible] Irish descent. Their rea[illegible] Blythe. Father Mauric[illegible] stage name from a playb[illegible] in a London theater. [illegible] several plays in which [illegible] and he performed in [illegible] Maurice's wife, Georgia [illegible] daughter of another acti[illegible]

The Barrymore family ... the theater. One ... spent most of h...
important member was ... of Lionel, Ethel, ... children wer...
and John Barrymore. Brough... the United States ... Ethel...

Sister Ethel, born in ... her 78th birth...
praised for her beauty ... on a special t...
for her acting. He... the entertain... She...
was opposite ... died in 1959.
Irving in *Pet...* The youn... , born ... has spent
starred as Ma... in 1882, wo... because ... pictures and
tain Jinks of... of his handsome ... became ... the variety of
Her cl... a matin... *Justice,* ... on which he has
Ophelia, ... *Redem...* ... United States are
Green, ... tion ... "Playho... and the "Westing-
her g... Miss Mo... John ... Jr., performed ... motion pictures. Diana, ... in 1921, impressed the critics in such
er. She also ... television and ... 1944 she won an... ard for *None but the Lo...* t. On

BARTER, ... changing goods wi... money. Barter occu... is available. Fo... through a newspaper adve...ement a person

THE GOLDEN HOME AND

THE GOLDEN HOME AND HIGH SCHOOL ENCYCLOPEDIA, while sufficiently comprehensive and detailed for family use, has been created principally for students at the high school level.

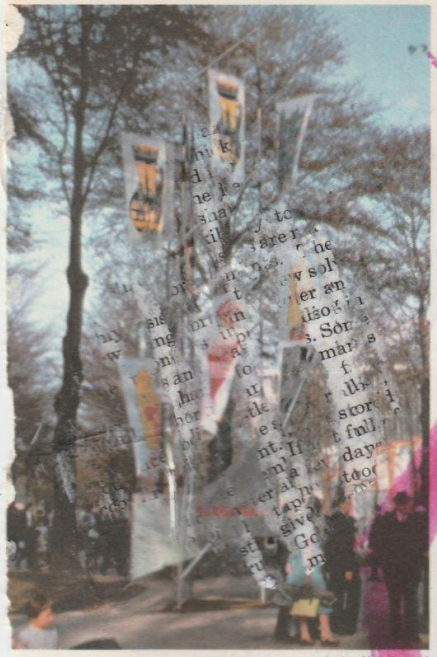
The aim of this reference work is twofold: first, to serve the student's immediate need for authoritative information on a wide range of subjects, and, second, to set forth and explain the many areas of knowledge, so that a student may explore them and thus more competently plan his educational future.

Arranged alphabetically in twenty volumes, here are thousands of full, accurate entries, written and reviewed by experts. The text is abundantly illustrated with full-color photographs and paintings.

Designed to complement the high school curriculum, this encyclopedia offers help with assignments and valuable guidance in the use of other reference tools —dictionaries, atlases, and various library materials. Extensive cross-references and a complete index direct the reader quickly to the information he seeks. A special feature of this work is the sound career information it offers in scores of job and professional fields.

Among the many subjects encompassed in these volumes are the newest developments in science, from microbiology to radioastronomy; fine arts and literature; history and government; religion and philosophy; the physical world, its plants and animals; the social sciences; invention and industry. Four-color maps and latest census figures contribute to an up-to-date view of the world, its continents, nations, and peoples.

Every care has been taken to make *The Golden Home and High School Encyclopedia* lively and stimulating, without sacrifice of accuracy. It is the hope of the editors that these volumes will be used with both advantage and pleasure.



Artha Hornbostel

Shown above is a scene from the 1958 World's Fair, held in Brussels, Belgium.

ing, scouring, roughening, and tar-spreading brushes. Lint brushes for cleaning clothes, carpets, and suede have brass wire bristles; others have plastic bristles that work by static electri[city].

The best brushes for painting houses have bristles taken from the backs of wild Chinese and Russian hogs. These bristles are known by the provinces in which they are gathered, such as Chungking, Hankow, and Siberian. In America, Chester White and Duroc hogs produce good bristles. The "flag" of a hog bristle is the split end that carries the paint. The other end of the bristle is embedded in rubber or similar material in the barrel of the brush. The tapered shape of each hog bristle gives flexibility to the whole brush. Good brushes are made from natural bristles. They are high-priced but resistant to the new synthetic cleaning agents now being used in lacquer and paint. Nylon is popular in toothbrushes and hairbrushes. Some brushes use hair from the tail and mane of horses.

A brush, like any other tool, should be used, cleaned, and stored according to its needs. If left in paint overnight or for a few days, a brush should be hung, not stood, in a can containing the proper solvent. An easy way to do this is to run a heavy piece of wire through a hole bored in the handle and rest the wire on the [rim] of the can. New brushes should be soaked in linseed oil or turpentine before using. Use turpentine; [other] natured alcohol for shellac, varnish, and lacquer.

BRUSSELS is the capital city of Belgium and the center of the country's commerce. The city lies on the Senne River. The city was once surrounded by a wall, but in the 1800's this was torn down and broad boulevards lined with rows of shade trees replaced the old town wall. The Senne River, which stands today as a canal, flows through the city. Brussels has a population of approximately 1,000,000.

Brussels is known for its splendid public buildings, palaces, and churches. Its museums, art galleries, and libraries are also well known. Brussels is a leading manufacturing city. Its chief manufactured products are chemicals, textiles, and metal goods.

Brussels was founded in the 10th century. For many years it was the capital of the Low Countries. In 1815 it took part in the revolt against Spain. When Belgium became independent in 1830, Brussels became the capital. The city was rebuilt in 1958 as the site of the World's Fair, which attracted visitors from all over the world.

BRUTUS, [illegible] (42 B.C.), one of the assassins of Julius Caesar. Brutus was a nephew of Cato the Younger. He fought on the side of Pompey the Great against Caesar in the civil war; but after the battle of Pharsalus (48 B.C.) Brutus made his peace with Caesar and accepted many honors and favors from him. Others did not trust Caesar, but Brutus believed that Caesar would not make himself a king. Therefore Cassius in the plot to take Caesar's life and was one of those who stabbed him.

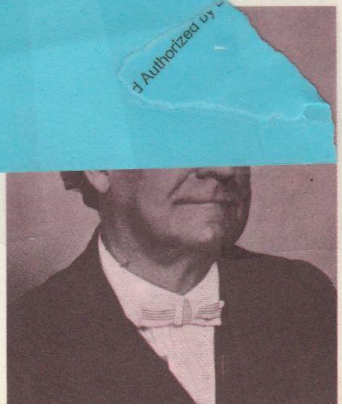
After the murder of Caesar, Brutus fled to Macedonia, where he raised a large army to fight Antony and Octavius (Augustus Caesar). The armies met at Philippi, where two battles were fought. Cassius stabbed himself after the first battle, and Brutus died in the same way after the second one, 20 days later. When his wife, Portia, heard of his death, she also killed herself. Brutus is one of the principal characters in Shakespeare's play *Julius Caesar*.

Brutus, one of Caesar's murderers

[WILLIAM] JENNINGS (1860–1925), an American politician known as The Commoner, was born at Salem, Ill. He was graduated in 1881 from Illinois College, Jacksonville, with the highest honors of his class; he received the degree of LL.B. in 1883 from the Union College of Law, Chicago. After practicing law at Jacksonville, Ill., and at Lincoln, Neb., he represented the First District of Nebraska in Congress from 1891 to 1895. In 1896 he was the Democratic nominee for president of the United States but received only 176 electoral votes against 271 for William McKinley. In 1898 he raised a regiment of volunteers in Nebraska for the Spanish-American War and was elected its colonel, but he saw no active service. He was again nominated for the presidency in 1900 but received only 155 votes against 292 for McKinley. [illegible] he established at [illegible] tical paper en-

Paid for an[illegible]

U.S. politician



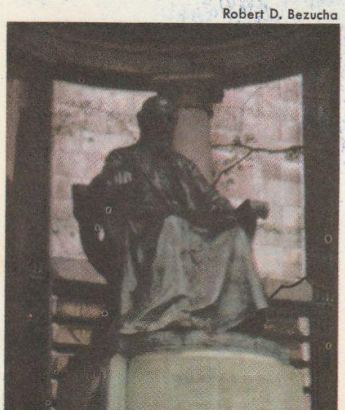
titled the *Commoner*. In 1906 he made a tour of the world, and in 1908 he was for the third time the Democratic candidate for president but received only 162 votes against 321 for William Howard Taft. President Wilson appointed him secretary of state, Mar. 4, 1913, from which office he resigned Jan. 9, 1915. A strong supporter of prohibition, he exerted all his influence in favor of the adoption of the 18th Amendment to the Constitution. Bryan was the chief counsel for the prosecution in the trial of John T. Scopes for teaching evolution in the high school at Dayton, Tenn.; Clarence Darrow was the counsel for Scopes, who was convicted and fined.

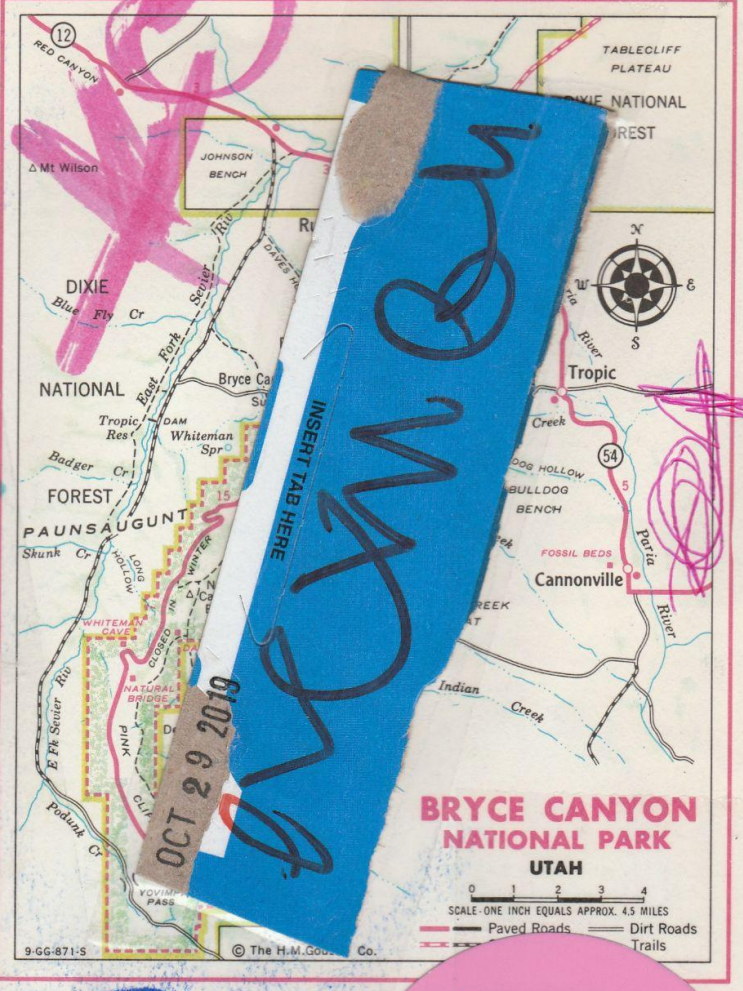
BRYANT, WILLIAM CULLEN (1794-1878), the first major American poet, was born in Cummington, Mass. When he was 10 he wrote poetry. At 13 he published a long poem called "The Spanish Revolution." He was admitted to the bar in 1815 but soon began to study for a literary life. He went to Williams College but left after a year. He published two poems which were printed in 1808 when he was 13 years old. In 1821 he published a volume of poems that brought him fame. In 1825 he went to New York City to live. A year later he became editor of the *Evening Post*, a newspaper with which he was connected for the rest of his life. He traveled both at home and abroad, and became acquainted himself with the literature of all the principal nations of Europe.

Primarily a nature poet, Bryant wrote in a simple, restrained, and dignified style. Among his best-known poems are "To a Waterfowl," "To a Fringed Gentian," and "Mutation." He died in New York.

This statue in New York City was erected in honor of the poet William Cullen Bryant.

Robert D. Bezucha



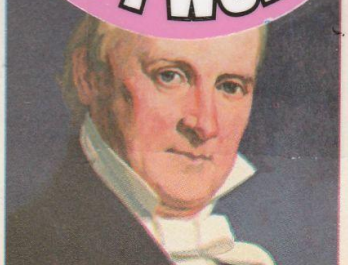


Bryce Canyon National Park was named for its ho... This map shows the location of the numerous sight...

BRYCE CANYON NATIONAL PARK in southwestern Utah includes some of the most interesting exposures of the Pink Cliffs formation. It is filled with rock pinnacles of many shapes and bright colors. The park covers more than 36,000 acres. It was established in 1928.

In reality Bryce is not a canyon. It is a group of horseshoe-shaped amphitheaters cut by water erosion into a plateau. It extends down 1,000 feet through its pink and white marly limestone. The largest amphitheater is 3 miles long and about 2 miles wide. It is filled with myriads of fantastic figures cut by weathering influences.

BTU. See BRITISH THERMAL UNIT.



BRUCE, ROBERT THE (1274-1329), of Robert I, king of Scotland, called the Bruce, was the hero of Scotland's war for independence from England.

Robert the Bruce was born probably at Turnberry Castle in Ayr. His grandfather laid claim to the Scottish crown, but the English king, Edward I, supported another claimant, John Baliol. In 1296 Robert and his father did homage to the English king, who took the crown of Scotland himself. But shortly after, Robert repudiated this homage and joined the Scottish patriot and rebel William Wallace. After Wallace was captured and put to death by the English, the Scots continued their war of independence under Robert the Bruce, who was crowned king of Scotland in 1306.

During the first years of his reign the English were victorious and drove Robert out of Scotland. But Robert's valiant generalship and Scottish patriotism triumphed over the English in the decisive Battle of Bannockburn, on June 24, 1314. The English, however, refused to recognize Robert as king or the independence of Scotland until the Treaty of Northampton in 1328. Robert proved himself an able administrator, established a stable government in Scotland, and gained the recognition of his country by foreign governments.

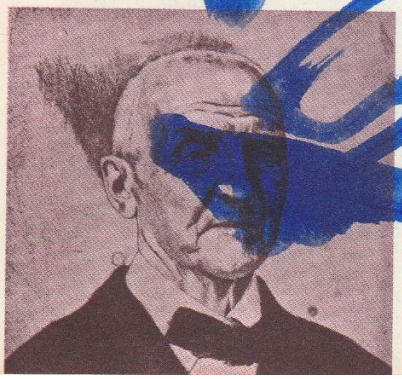
BRUCELLOSIS. See UNDULANT FEVER.

BRUCKNER, ANTON (1824-1896), Austrian composer, was born at Ansfelden, the son of a schoolmaster. Bruckner showed remarkable musical talent when a child, but he received no expert instruction in music until he was 11 years old. He was then instructed in the organ and in harmony. From 1837 to 1840 he was a choir boy at St. Florian's monastery. Bruckner continued his musical education, and in 1845 he was given an appointment at St. Florian's. In 1851 he became organist for that institution.

Bruckner's first notable work was his Requiem in D Minor. From 1855 to 1861 he studied musical theory with Simon Sechter, a Viennese professor of counterpoint. In 1856 Bruckner won an open competition for organist at the Cathedral of Linz, a post he kept until 1868. In 1865 he met Wagner, who influenced Bruckner's further development. Bruckner's first mature work was his Mass in D Minor of 1864. In that same year appeared his Symphony in D Minor. The demands of composing these works forced Bruckner's breakdown. He quickly recovered and in gratitude composed his Mass in F Minor.

In 1868 Bruckner settled in Vienna and there faced great hostility. Until 1881, when Hans Richter conducted Bruckner's Fourth Symphony, Bruckner was boycotted by conductors. After that, however, he attained great fame in both Europe and America. In addition to his religious works, his Symphony in F Minor, and his Symphony in D Minor, Bruckner wrote nine other symphonies, the last of which was unfinished at his death.

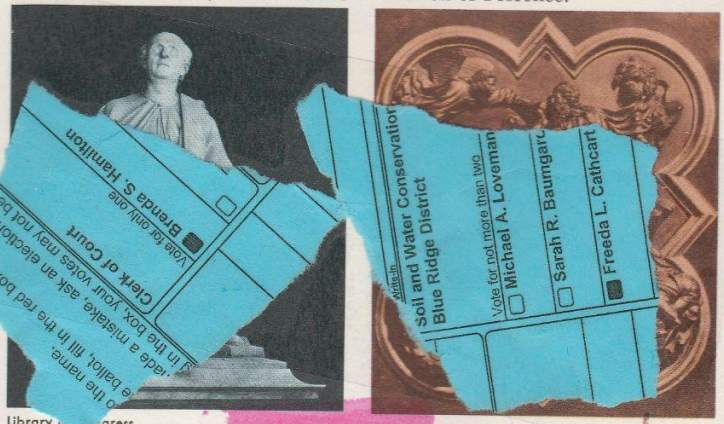
Anton Bruckner, romantic composer. Photo, Brown Bros.



BRUISE. A bruise is caused by an injury that breaks the small blood vessels in the tissues just under the skin. As the blood oozes into the tissues from these broken vessels, it causes swelling and discoloration, as in the familiar "black eye." Usually no treatment is needed. Ice or cloths wrung out of very cold water, when applied immediately, help to prevent discoloration, to keep down the swelling, and to relieve the pain.

BRUNELLESCHI, FILIPPO (1377-1446), an Italian architect, was born in Florence. He received a good general education and then learned the goldsmith's art. For a time also he studied sculpture and was considered one of the leading sculptors of Florence, but he finally adopted architecture as his chief profession.

He was chosen in 1407 to undertake the completion of the famous Cathedral in Florence, which had been designed by Arnolfo di Cambio. It had no dome. No one at the time had built a large dome, and the construction was not understood. Brunelleschi built a cupola, known as one of the greatest architectural works in existence. He also built the Pitti Palace and the church of St. Lorenzo in Florence. He was for a long time a member of the Supreme Council of Florence.



Library of Congress

The artist, sculptor, and architect Brunelleschi was one of the pioneers of Renaissance art. A statue of him and a decorative panel made by him are shown above. Much of his work was inspired by his study of the remains of Greek and Roman art so plentiful in Italy.

BRUSH, a device consisting of metal, fiber, or hair bristles set in a handle. A paintbrush applies material, a wire brush removes it, and a hairbrush arranges it. Brushes should be kept clean and should never rest on their bristles.

Scouring brushes, both hand and power driven, are used in garages to remove carbon and rust, in house painting to remove dirt and loose paint, in finishing masonry, in roughening surfaces before the application of stucco, and in floor cleaning in preparation for varnishing and painting. On a 2-inch long polishing brush with a diameter of 1½ inches there may be as many as 242,144 soft steel bristles .006 inch thick. The wire bristles of coarse cleaning brushes are much thicker. Brass, aluminum, and coarse fibers such as tampico are also set in clean-

Ram-shaped clay relic of the Bronze Age.

BRONZE AGE, the age in the history of man during which he made bronze implements. The Bronze Age came after the Stone Age and before the Iron Age. Yet we cannot draw a distinct line between these ages. The Australian aborigines, for example, never reached the Bronze Age. And the Aztecs and Incas were still in the Bronze Age when the Europeans had reached the Age of Iron.

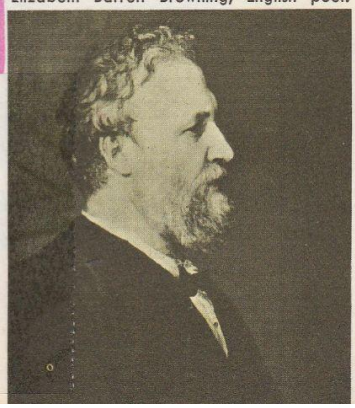
Man probably began to use cop-

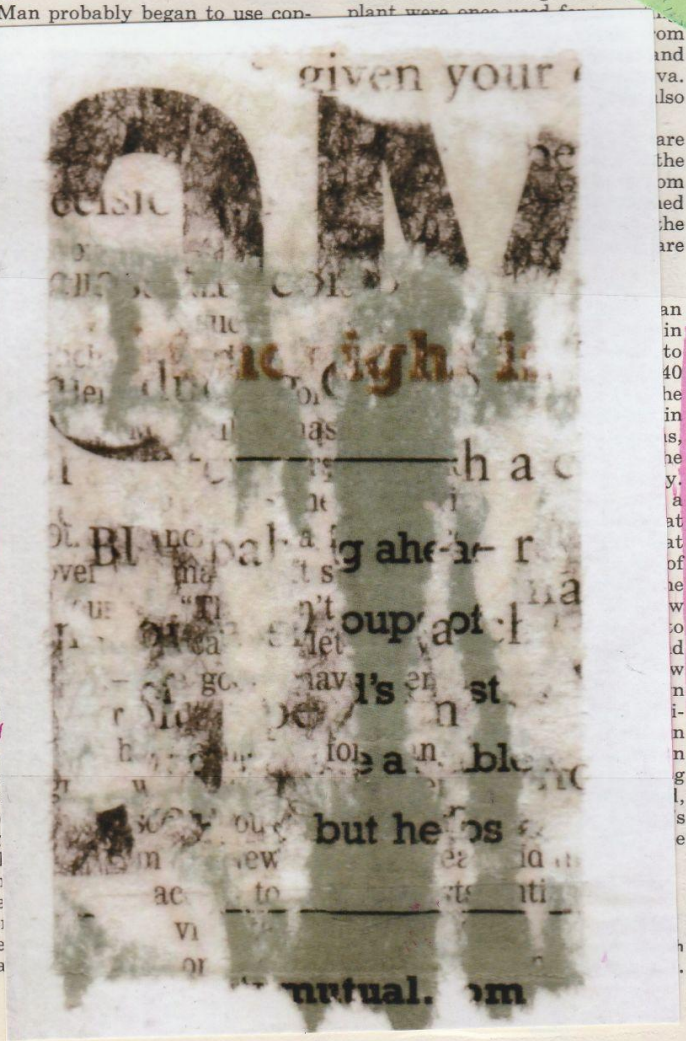
BROOKE, RUPERT (1887-1915), English poet and the son of a sc… master, was born at Rugby. H… educated there and at Car… University. Brooke's *Po…* peared in 1911, and in the… year he collaborated w… other poets in produc… *Poetry: 1911-1912.* … next few years tra… turned home befor… World War I. H… tained a commis… was sent to the… died on the isl… entitled *191…* published … *Poems* wa… in 1918.

BROOM, a bundle… or fibers tied to the e… and used for sweeping. … a broom because twigs of the … plant were once used fo…

…ING, ROBERT (1812-1889) **…BETH BARRETT** (1806-… English poets of the …born in Cam-…y a little …idely, …he …ng …ono-…n are …and …, born in …a partial …companion …She started …in 1836. After she … …ng and moved to Italy, … improved. There she did muc… her best writing. This included *Poems Before Congress*, *Last Poems*, and a novel in verse, *Aurora Leigh*. Her best known work is *Sonnets from the Portuguese*. She became the subject of Rudolf Besier's play *The Barretts of Wimpole Street* in 1930.

Elizabeth Barrett Browning, English poet.





Courtesy of WRAC, Racine, Wis.

a transcribed commercial.

of radio
means of electric
casting began about 1920,
vision, about 1940. Both types of programs are put on for entertainment or for the dissemination of information.

Since broadcasting is designed for the general public, international agreements had to be drawn up to prevent radiation interference between national stations. Domestic broadcasting was assigned to long-wave and medium-wave bands in the radio spectrum; and international broadcasting, to short-wave frequency.

Radio rehearsals and performances take place in studios. The speakers talk into microphones that are connected to the control room. Here, operators adjust the level of electrical currents and route incoming programs to different senders. Senders are linked to receiving sets that control station, volume, and tone as the listener chooses. Television broadcasting operates in much the same way. Performers act before cameras (microphones for sound pickup are placed outside camera range) that generate video signals. Eventually these signals are reconverted to visual images and adjusted on the screens of receiving sets as the viewers please.

Broadcast technicians watch dials and monitors in a television control room. They must keep all equipment functioning properly.

Courtesy of NBC-TV

ited States, broadcast-
paid by various corpo-
change for the advertis-
products on radio and
programs. In most Euro-
pean countries the government sponsors most of the radio and television broadcasting by means of license taxes on receiving sets.

BROGLIE, LOUIS VICTOR DE (1892-), French physicist, born in Dieppe. He studied at the University of Paris and later became a lecturer there. In 1933 he was appointed professor of theoretical physics at the Henri Poincaré Institute of the University of Paris. He did research on the quantum theory and became noted for his wave theory of matter. In 1929 he was awarded the Nobel prize in physics.

BROMINE, symbol Br, is a dark-red liquid, about three times as dense as water. It is very dangerous to handle as it inflicts terrible burns. The fumes from it are poisonously irritating to the eyes and breathing organs. It is one of the only two elements that are liquid at room temperature—mercury is the other one.

Bromine was discovered over a century ago by a French chemist while he was crystallizing salt from sea water. It has since been found to be present in small quantities in all sea water and in most mineral springs.

The salts of bromine are called bromides, and several of them are commercially valuable. Potassium bromide is used by doctors as a sedative. Silver bromide is used for sensitizing photographic plates, because it is decomposed by light, and ethylene dibromide is used in making antiknock gasoline for automobiles. Xylyl bromide and bromo-acetone are used to make tear gas for war or police purposes. In certain insecticides methyl bromide is used.

Bromine is extracted as a by-product from salt wells in Michigan, Ohio, West Virginia, and California. It can also be extracted from sea water.

BRONTË, the name of a famous English family that produced three important novelists of the 19th century.

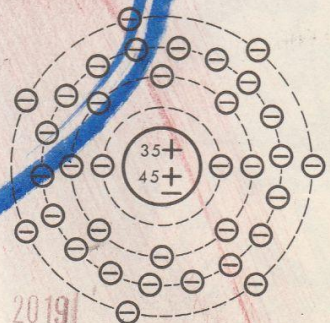
Charlotte (pseudonym Currer Bell) was born in Thornton, Yorkshire, in 1816. She was the eldest daughter of Patrick Brontë, a well-educated clergyman of Irish extraction, and was the sister of Branwell, Emily, and Anne Brontë.

The children were reared by their aunt in the parsonage at Haworth, Yorkshire, after the death of their mother. All of them showed a precocious talent for imaginative writing. Charlotte studied at the Cowan Bridge school for children of poor clergymen, as did Emily. They also trained as governesses at Miss Wooler's school in Dewsbury.

Charlotte conceived a plan to establish a school run by the three girls. When her aunt died, she was forced to give up the plan. She then turned to literature. She contributed 19 verses to *Poems, by Currer, Ellis, and Acton Bell* and completed her first novel, *The Professor*. In 1847 her novel *Jane Eyre* was published and became an immediate success. In it Charlotte bitterly depicted her school as a grim, although charitable, institution. She believed that the school's poor conditions led to her sisters' deaths.

After the deaths of her brother and her sisters, she became saddened and lonely. She visited London and made friends among the

In this diagram of a bromine atom the 35 electrons (−) are arranged around the nucleus, containing 35 protons (+). Thus bromine has atomic number 35. In the radioactive isotope shown here (atomic weight 80), the nucleus also contains 45 neutrons.



literary crowd [illegible] a few months aft[illegible] mar[illegible] to her father's [illegible]te in 1855.

Emily [illegible]**ne** (pseudonym [illegible] Bell) was al[illegible] born in Thornton, York-shire, [illegible] 1818. [illegible]er only [illegible]vel, *Wuthering Heights*, is consider[illegible] by some [illegible]ics to be a master[illegible]ce. Others have thought she was the only sist[illegible] with a real poetic talent. Her novel [illegible] published in 1847, and a year later she died from tuberculosis.

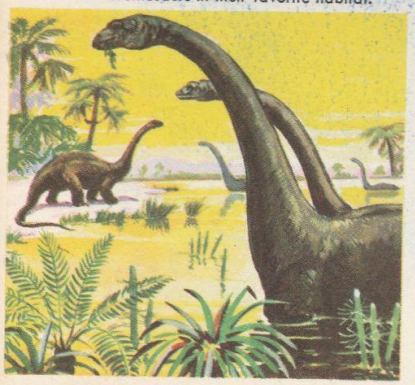
Anne (pseudonym Acton Bell), [illegible]

lived during the Jurassic. See DINOSAUR; GEOLOGIC TIME SCALE.

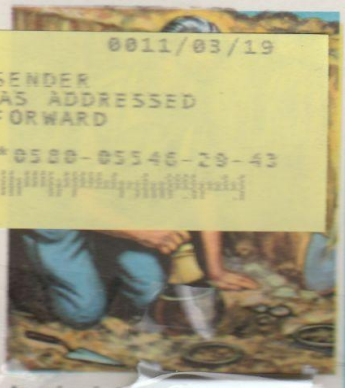
Brontosaurs were 65 to 80 feet long and weighed 30 to 40 tons. They had long, slender necks, small heads, short, heavy bodies, thick, straight legs, and long tails. The tail was massive near the hips but tapered to a whiplash. They walked on four feet. The hindlegs of brontosaurs were longer and more massive than the front legs. Brontosaurs had tiny brains and were slow moving and sluggish.

Brontosaurs lived in tropical, swampy areas and ate green plants in large quantities. Because of their tremendous sizes, brontosaurs probably found it difficult to walk on dry land. They spent much of their time wading about in shallow water. (If a reptile doubles its size, its weight is eight times as great, but its legs are only four times as strong. After the reptile reaches a certain size, its legs are not able to support the weight of its body. If the reptile wades partially submerged in water, the water supports part of the body weight.)

Brontosaurs in their favorite habitat.



Above are shown a piece of jewelry and two knives dating from [illegible]nze Age. When people first discovered how to make bronze, they modeled the tools th[illegible]e from it on their old stone tools. As they became more experienced with the new alloy, [illegible]odified and improved the bronze tools. Pots were also made from bronze, which re[illegible] highly useful metal.



An archaeologist [illegible] which was brought [illegible] some [illegible] LIFT & REMOVE [illegible] pictures at right.

BRONZE is a copper-base alloy. In true bronze, tin is the main alloying element, but the meaning of the word has been broadened to include all copper-base alloys containing zinc or alloying elements other than zinc if those elements are in sufficient amounts to be predominant over the zinc in the alloy.

Bronze was known to, and used by, the ancient Assyrians and Egyptians. Indeed, one period of prehistoric time is known as the Bronze Age. Late in the Stone Age, man in the Near East began to make some use of copper. The discovery that tin could be combined with molten copper to form a new and stronger metal led to the opening of trade routes in search of ores. By 2500 B.C., Egypt and Mesopotamia were leaders in a new civilization.

Bronze today has many important industrial uses. In its earliest forms it was also undoubtedly employed for the manufacture of tools and implements, but modern man knows most about ancient bronze because of its wide use in art and ornament. Examples are Egyptian, Assyrian, and ancient Chinese statues, utensils, and ornaments.

Bronze was the favorite material used by the Greeks and Romans for their many public monuments because hollow figures made of this metal were light in weight, resisted deterioration through exposure, and had a pleasing color and luster. Bronze may vary from a reddish brown to yellow, or even silver, according to the proportions of the alloy and the purity of the alloying elements.

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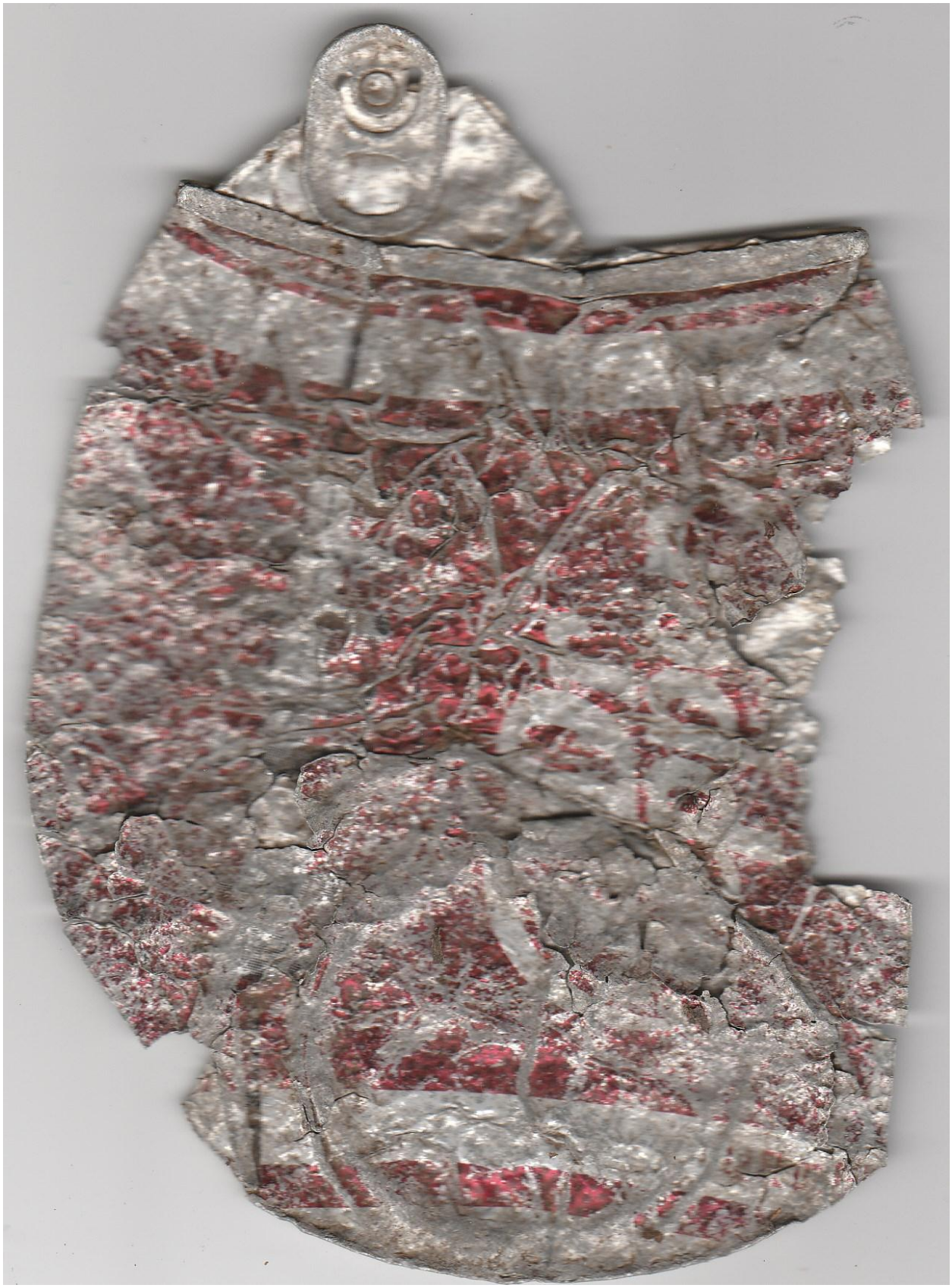

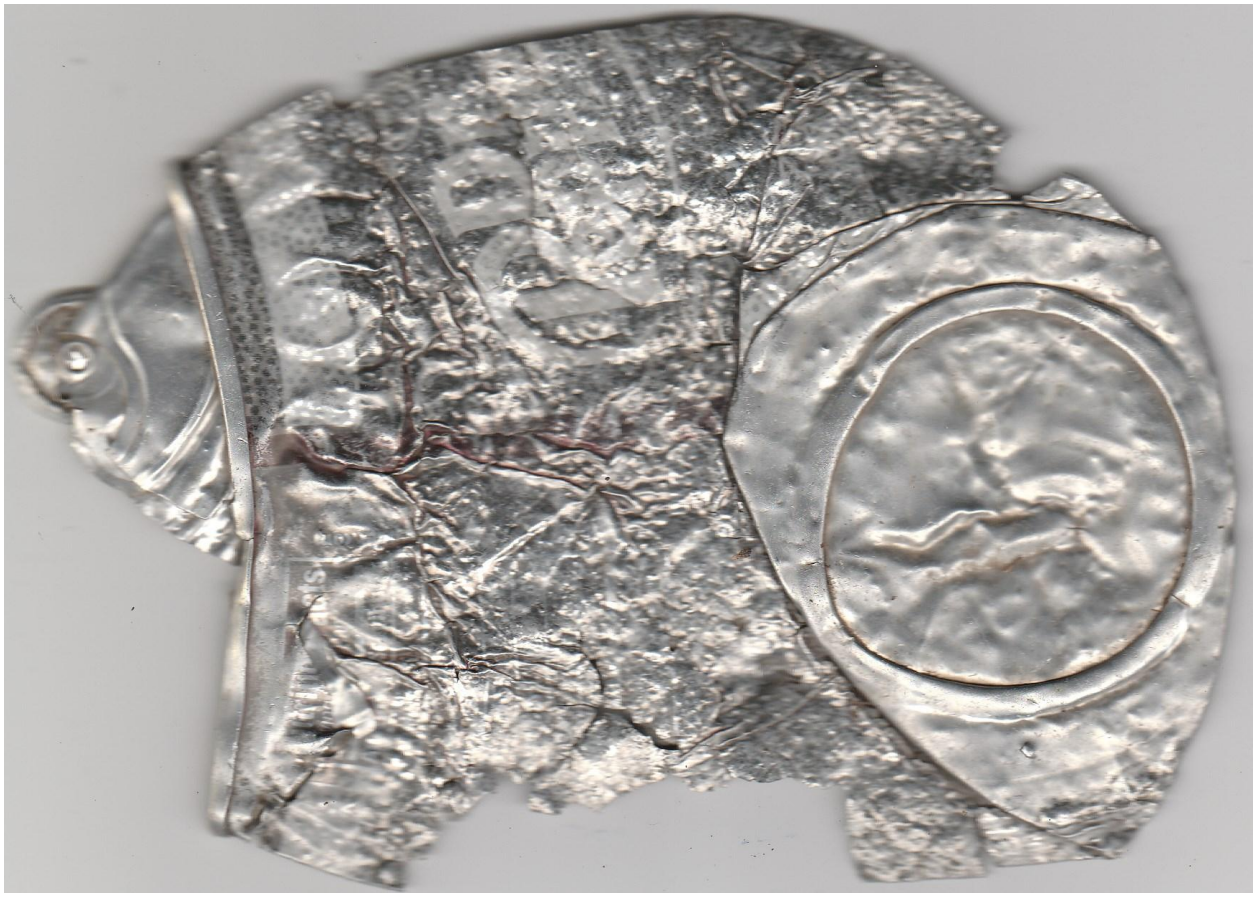


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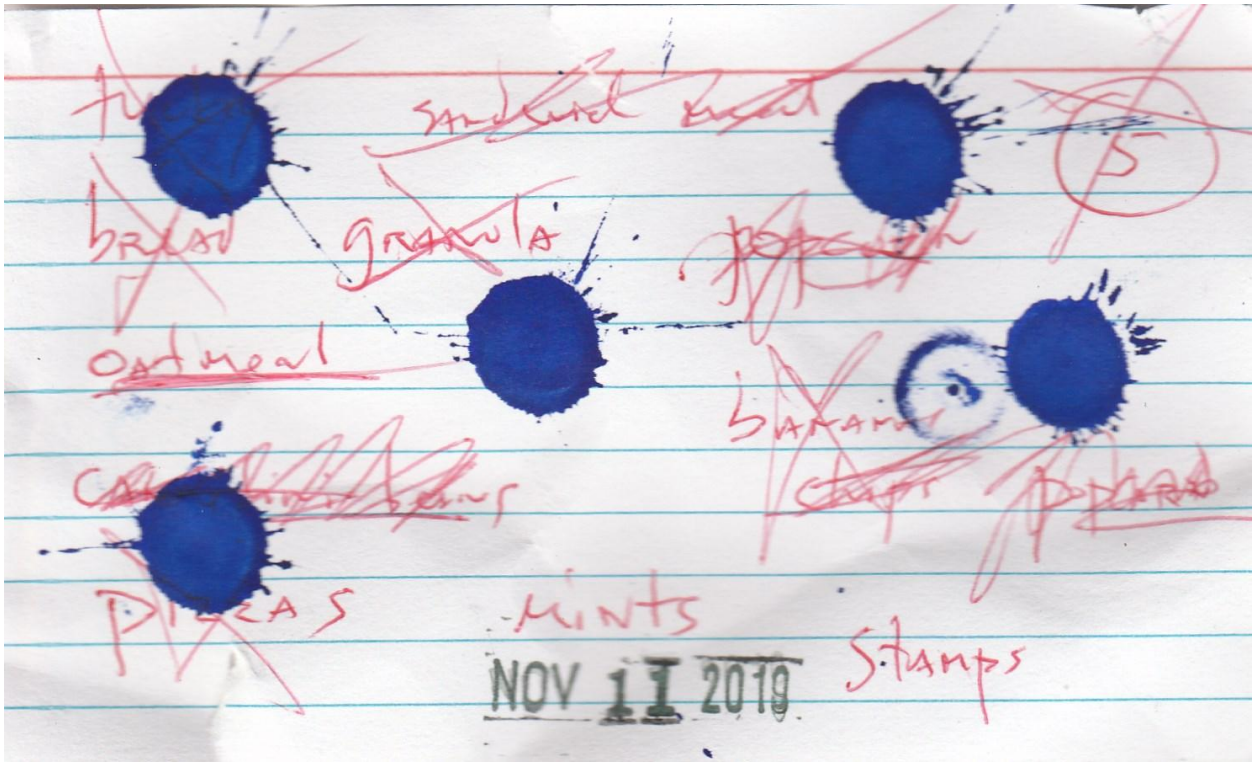
Oatmeal
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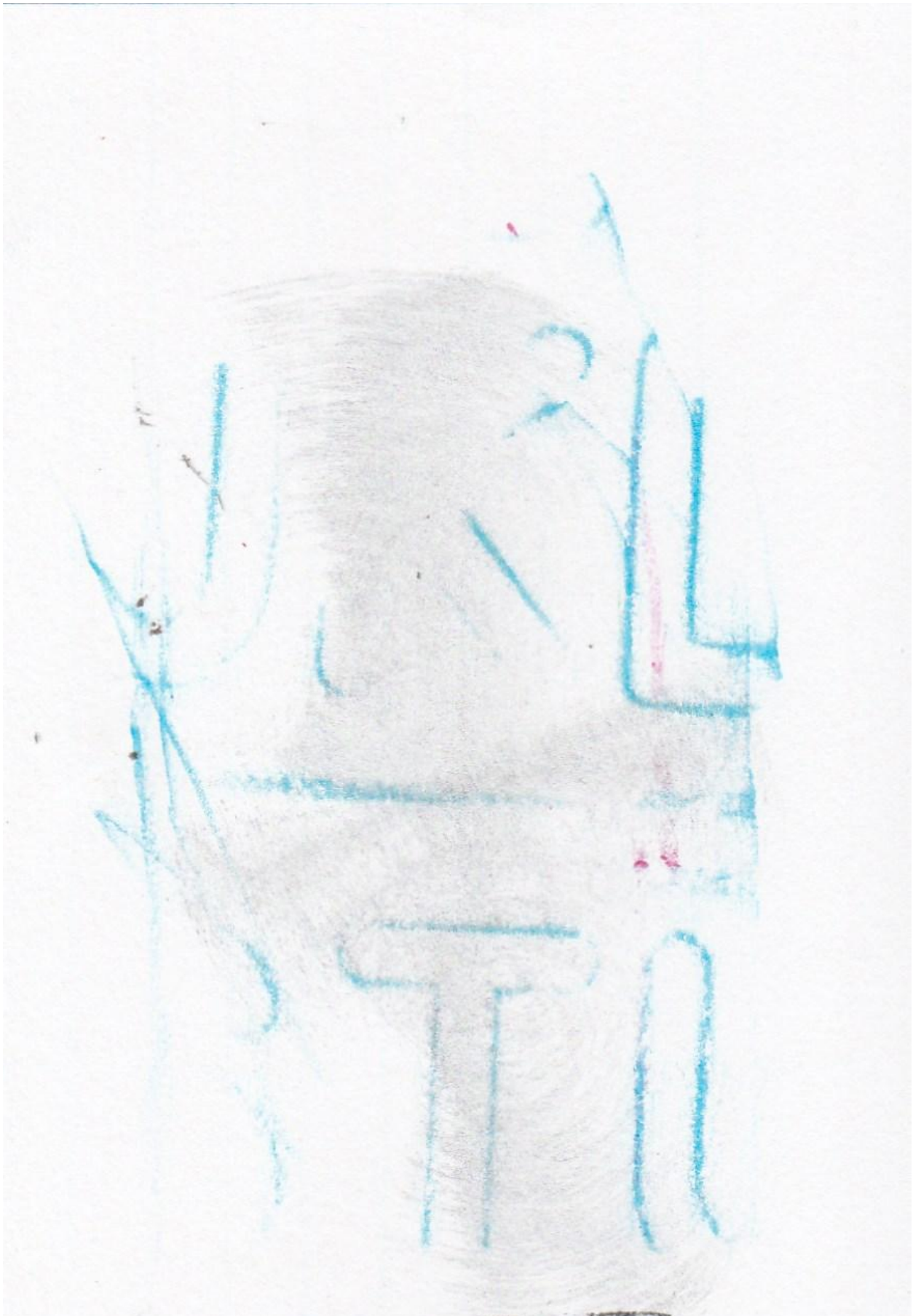
Movie
Theater
Butter
Popcorn



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cling the globe, above and below the equator. Often they lie in the western portions of continents, where warm, dry air sweeps aw

America's S bran Desert is affected by all these

Cali moist

ic. The co

ions al a (Lower) California. The inter

t was the land forms typical of all deserts—bare,

t ephemeral swept down the mountain-

des ddy rain, nestled

ds, pitted

erbeds, and

dry lakes

to illustrate the world's deserts.

TIC DESERTS

Ocean

In the des

surface can be clearly seen. Rugged

mo

n between

cliffs of

sun.

Stran

nning

wa

t. Wild

carving

this sedi-

they spread

rock beneath

nds.

ry washes,

yas. But

g of mud

alts

may

ring of salt

(below right). Here at the foot of moun-

of heavy erosion, swift-running

ve carved soft rock canyons and ridges.

(below left) was given this sha

ying, over

shattering rock at

edges are


Art
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Art
always cr
WILDBERRY
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THE DESERT

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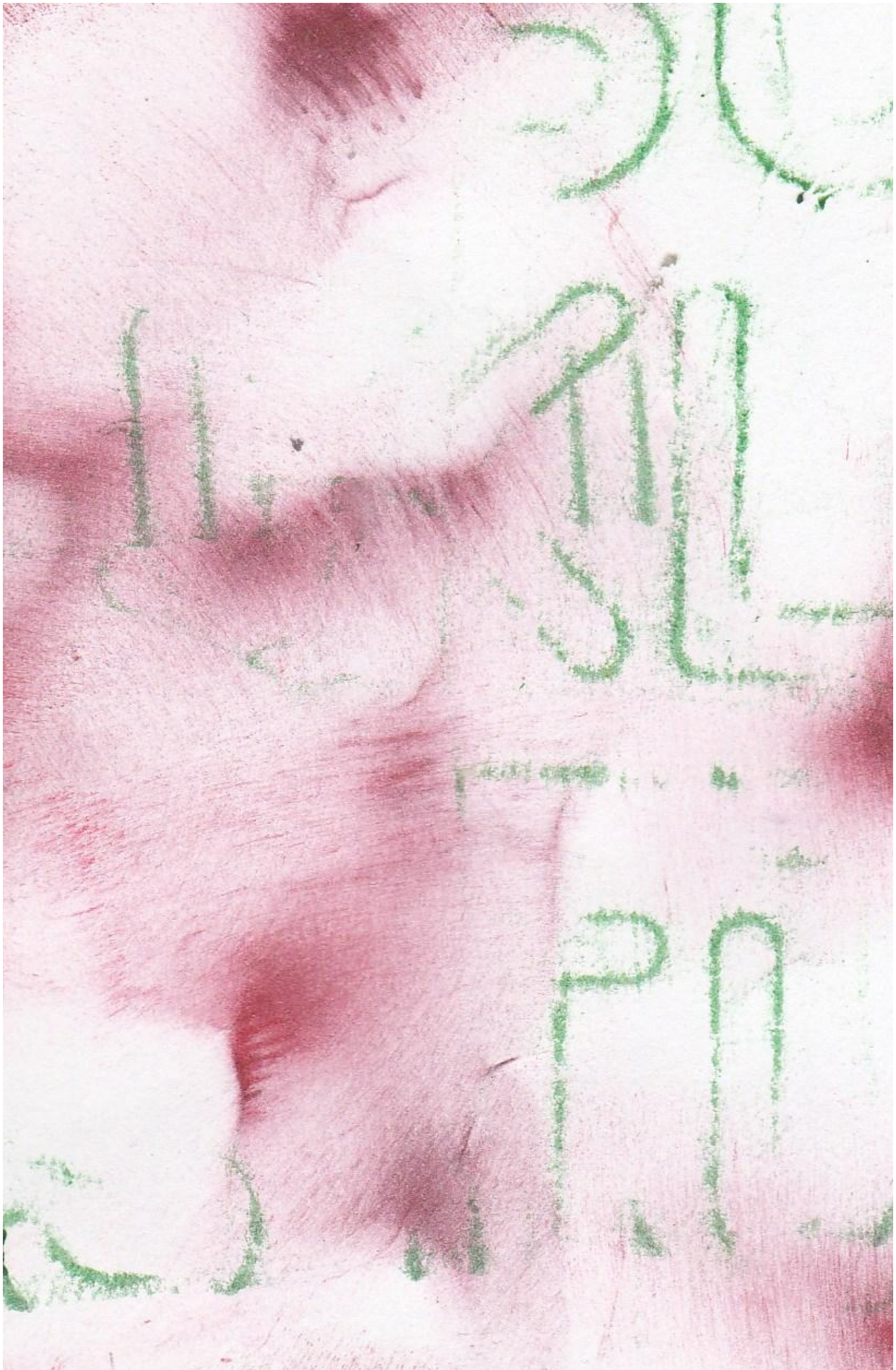


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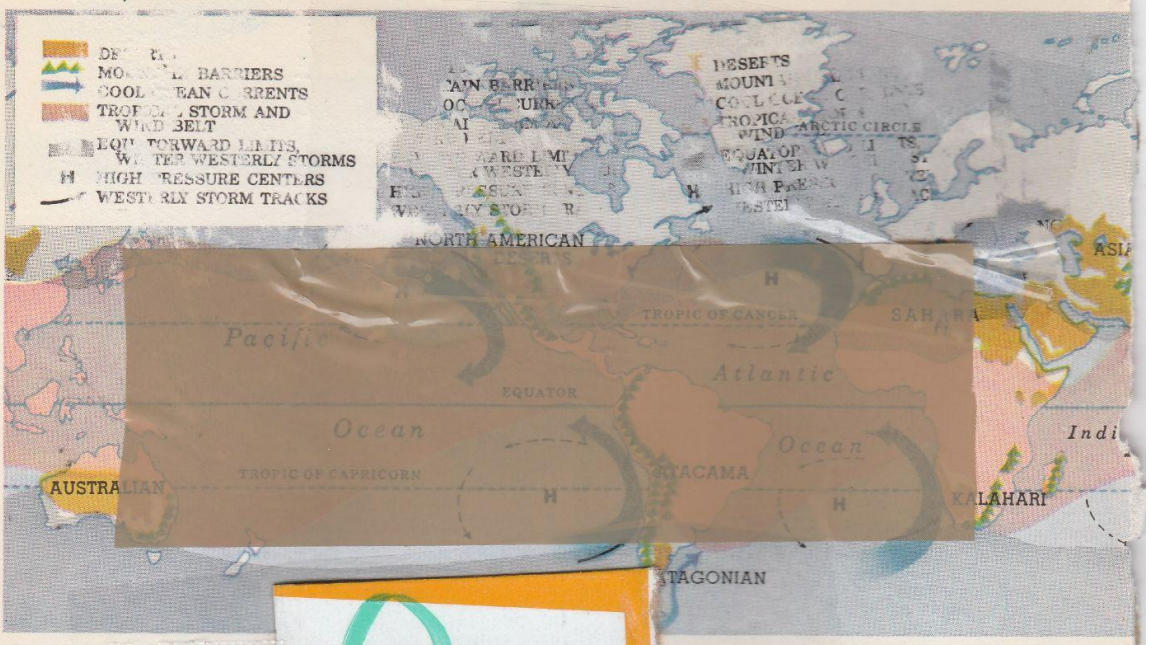

...in the air at any time. Excep... "fog" deserts of South Amer... have moist air, clouds, and ... no rain. The Sahara, on th... cloud cover of only 10 perce... and less than 4 percent from ...

Deserts are the hottest p... highest temperatures ever off... taken in the Sahara, 136°F... U. S. record is not much lo... Valley, California.

Because they have so little ... deserts lose heat quickly whe... may be very warm, nights ... also have wide ranges of temp... to season. Middle-latitude des... scorching summers and freezi...

CAUSES OF DESERTS

The deserts of today did not al... them developed during the las...

...le the earth north and south of the equator.

...h's present highest mountains were ... up. These mountains helped cause ...s. Moisture-laden winds lose their ... they move against and over cool, ... Some of the rainiest regions on earth ...windward side of mountains, and ...e same mountains lie deserts.

...ons become deserts because they are ...ea. Seacoasts are likely to be warmer ...egions. As warm, moist winds blow ...tend to cool and lose moisture on ...

...al deserts of Chile and Peru lie ...an. They are deserts because of ...e Current, which sweeps up the ...ds the soft, damp Pacific breezes ...heir moisture into fog. When this ... rolls inland it is warmed. As ...arry more moisture than before, ...land, rarely dropping rain. The ... South America is the driest in ...f an inch of rain per year— ... few miles from the sea.

...in two bands cir-

PART IX

THE LAND OF THE SUN

WHAT IS A DESERT?

ALL DESERTS, wherever they are, are alike in some
of the sky—enormous, overpoweringly blue by day
bowl sequinned with innumerable stars.
hey are lands of the sun, with glaring light tha
th, leaving only soft tans, gray-gr
re the mantle of soil
cracke
across the flats, raising

The main characteristic of any dese
defining just what a desert is, but the simplest de
has an annual rainfall of less than 10 inches. It is
hapes all the other characteristics of the desert-
none at all; the animals, small,
go through life without
All these ar
for an hour or two

lands
purple
bright
reds.
e that
ıd lies
ls race
p rain.
ays of
which
ll that
plants
s many
e wind-
of rain.
will fill
anyons

...deserts is the presence of mountains between them and the sea. Here are
...wooded slopes on coastal mountainsides facing the sea. As moisture-carrying winds
...w in from the sea and move up the cool mountainsides, they drop their moisture there.


BEST
IF USED
UPC / PURCHASE SEAL
20 PACKETS
INSTANT
RAISI
& W
replacemer
NOV 10 2019


FOR YOUNG READERS
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Heavy type refers to an il
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NOV 10 2079
SIMON
W YORK

FREE SWIMMERS OF THE OPEN SEA

Among large animals, the open waters are th
home of vertebrate fish especially, thou
invertebrates like the giant squid a
mals like the mighty whale
free swimmers move li
which swiftness,
oration are the key

Kings of speed are the , capable of spurts up e sailfish; the dol prey, the fly- ur and soars uch slower nic b ace-dwelling tinted by to blend with the . Domi- ant colors are green, blu ea crea- tures in the sunlit upper levels are often bluish above and silver underneath. From about 600 to 1,500 feet, a twilight grayish zone, the fish are

PART VII

CREATURES OF THE SEA

THE CRAD

AS WE READ e
was the sea.
tudes

the tug of
s or tree
need no
even of
d filled
quickly
mmal,
ght of

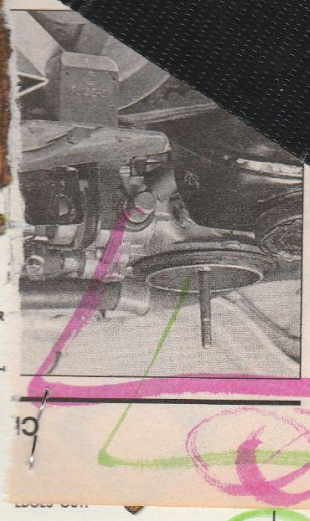
its body, awa
Thus the sea
life
life depends
because
ms to meet
makes
crea-
life
lop
ns.
er-
nt.
in
egion.
er can kill
ning the

to layers of life.
uch an animal lives,
e of the water on its body,
move from
another without injury,
atures must stay within certain
is essential to all the sea plants that make
ply of the sea. Most plants
certain min-
n growth.
of the sun,

o the water.
oft glow that
So the plants
upper, sunlit
350 feet down.


BIRD
ditioning systems
Route
Golden
PACIFIC
FLYWAY
ATLANTIC
FLYWAY
Chapter 3 Cooling
NOV 10 2019

WOODEN BIRDHOUSES



building the house is simple. All that the birds need is a sm om with roof, floor, and wal m should not be too square is large enou age bird. The hous able, rainproof, a be made so that or the roof can h the house. The placed at least ground and s trees or bushe preferred by tins and hou birds that li several roo

Robins, lows will open-shel only two wrens, n birds w with or trance. houses be too w shoul much at all. When gray the oil appeasured sidew com- per of new t. **Note:** new

SIZES FOR BIRDHOUSES

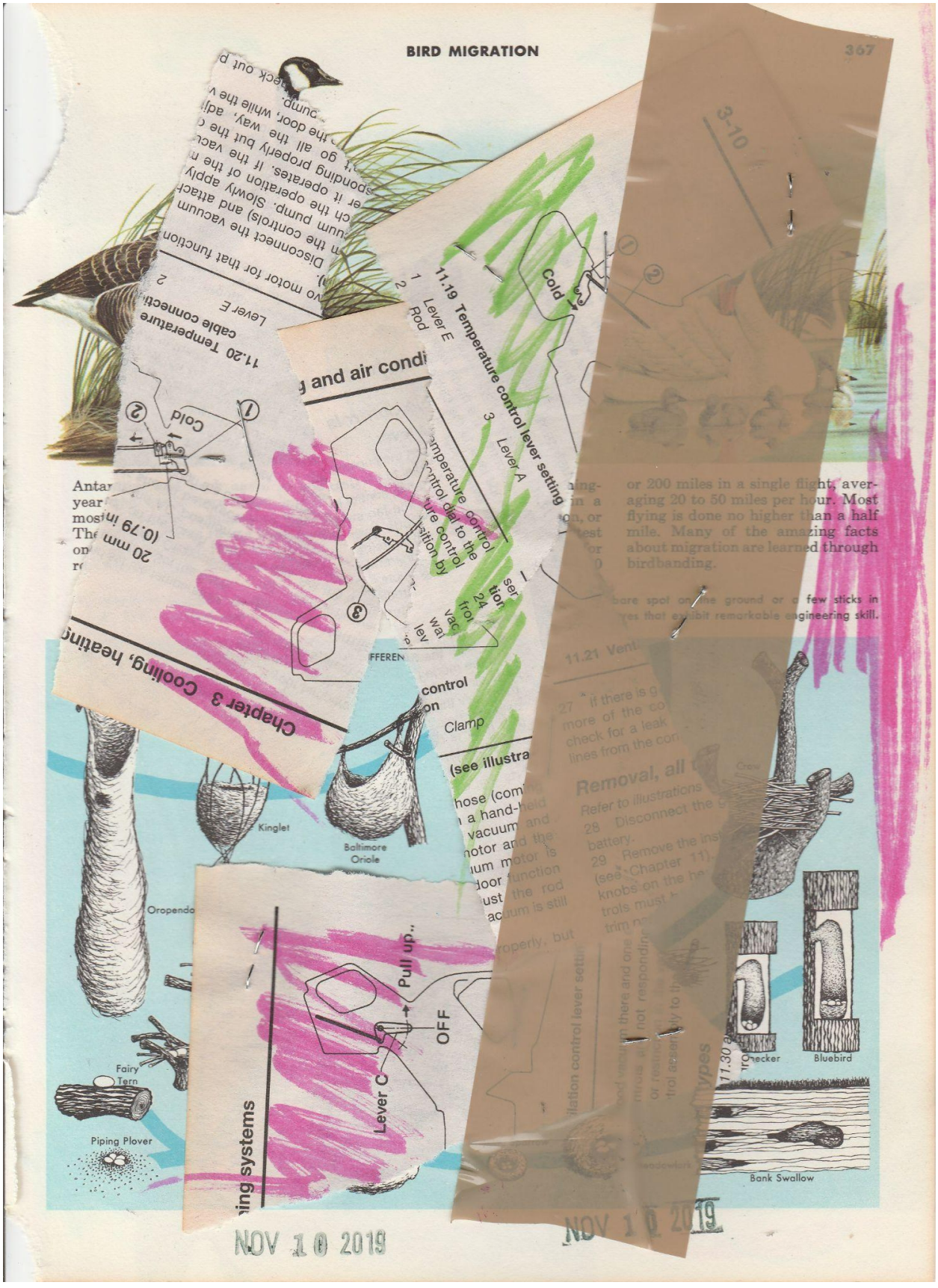
ND OF BIRD	FLOOR	DEPTH	EIGHT ABOVE GROUND
	4" x 4"	8"	5-12 feet
	4" x 4"		6-10 feet
	4" x 4"		12-15 feet
	5" x 5"		5-10 feet
	5" x 5"		10-15 feet
			16-20 feet
			12-20 feet

vari-
rs of the
presented
family is
song mimics

nect the re
ws) at the co
hen the clutch is eng
gine's speed. If the compr
urning too slow in relation to
the belt isn't properly te
instance), the system shuts
pressor.
11 If your compressor seems
soon after engaging, the pulser s
be at fault. First make sure that
rect clearance between the
the front of the clutch
illustration). Ad

are two species of mockingbird
brown thrasher; below, a cat


368
BIRD NEST
12 Air conditioning and
Air inlet control switch
and air condition
3-11
systems
The great reed warbler makes a pensile, open nest from strippings of water reeds.
Cooling, heating
Vacuum tank
Blower ASSY
Heater unit
11.31 Vacuum system
W: White or 1.
R: Red or 2.
L: Blue or 3.
Mode and panel ASSY


BIRD MIGRATION
367
or 200 miles in a single flight, averaging 20 to 50 miles per hour. Most flying is done no higher than a half mile. Many of the amazing facts about migration are learned through birdbanding.
11.19 Temperature control lever setting
Cold
Lever E
Rod
Lever A
11.20 Temperature cable connecti
Cold
Chapter 3 Cooling, heating
Kinglet
Baltimore Oriole
Oropendo
Fairy Tern
Piping Plover
Pull up..
OFF
Lever C
Checker
Bluebird
Bank Swallow
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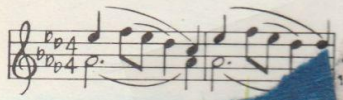
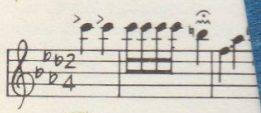
Whippoorwills sing persistently at night.



Silhouettes identify the types of soaring hawks: broad wings and broad tail, a buteo; short wings and long tail, an accipiter; pointed wings and long tail, a falcon.

Eastern meadowlarks have a slo



The song sparrow's song has many varia

disconnect the blower motor, tur not running) and c the green/white wire tion). If battery voltage a problem in the ignition If battery volta 5 the terminal

ses are intact. nder, discon- t the sender between the ne ground. mperature be 130 to

sending unit is secure and all fu To test the temperature se nect the electrical connector and connect an ohmmeter der's terminal and an engi e engine is at ambient te resistance should

electrical connector at the n the ignition key On (engine heck for battery voltage m terminal (see il

These fantas 43 species c closely relat birds do not of unattractiv alone builds cup of vines a eggs are laid assumes the c

is a most un- in the islands of lago. Birds of varieties, but or the brilliant al development e male. Some of ers two or three e body, and large namental plumes neath the wings. paradise, for in- y no larger than as tufts of golden plume t long. These can be rai ead out at pleasure so nceal the body of the body, and tail are wn, deepening to breast. The head w and emerald lead blue. The ther birds of rgeous. The nbines yel- lood red, its tail females lack- The lumage to e female during mating He struts and displays his stume on the branch of a e b admiring female.

The in trees and only occa on the ground. The the seeds of the te d of fig, but s and other ly against thers get y to go ll to the t easy

e first h sea its ats of ressing 100,000 aughtered demand.

y have given eings ever since st noticed the about him. Per- st prompted man wn melodies.

es its song by send- a voice box, called at is attached to the its trachea, or wind- singing of male birds is by their mating impulse. of most birds are fuller ovelier during the mating and eeding seasons than at other

birds strand with s riole

ther nmore ped nest suspends it om which it A relative of la, weaves 3 feet lon etween the v ottle n b

BIRD NEST in order to nests are mother bir in it. If th on her egg eggs woul The sh of variou which th Some n sooty te in the bother t catbird shaped weeds, Their forks

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